State of the Department of Grain Science & Industry and Our Current Priorities

Dr. Dirk E. Maier
Professor and Head
Vision for K-State’s Grain Science & Industry Department

“The global education, research and technology transfer leader for the grain & plant-based food, feed, fiber, fuel and bio-products supply chains.”
Mission of K-State’s Grain Science & Industry Department

“To educate students and professionals, conduct innovative research, transfer new technologies and knowledge, offer high-quality outreach programs and services to meet the needs of the global grain & plant-based food, feed, fiber, fuel and bio-products supply chains.”
Initial Priorities

- Grow our student enrollment
- Grow our research enterprise
- Grow our outreach efforts
Key Facts

• Faculty & Staff
  – 14 tenure track, 5 non-tenure track faculty; 16 adjunct
  – 22 professional staff; 11 classified staff

• Students
  – 180+ undergraduate students in 3 BS programs
  – 45+ graduate students in MS and PhD programs

• Facilities – mix of outdated and state-of-the-art

• Budget – Annual ~$5 mill; Extramural >$2.5 mill

• Alumni – Over 4,000 world wide

• Founding – 100-year anniversary in 2010
Initial Priorities

• Grow our outreach efforts
  – need to expand service activities
    • Wheat Quality Lab is a state, regional and national resource
    • Grain & Feed Microbiology & Toxicology Lab
    • Protein Lab, Flour & Dough Lab, Biomaterials Lab,
  – need to expand short course offerings
    • traditional IGP and NEW domestic opportunities
    • 2009: 24 short courses with 460 participants
  – need to initiate distance learning programs
    • GEAPS, AFIA, IAOM, AACC, …
    • 8 courses, 17 offers, 600 students, 17 countries
Kansas Wheat Quality Lab

Supported by the Kansas Wheat Commission
AFIA-KSU Feed Manufacturing Short Courses

Principles of Feed Manufacturing Short Course
June 10-13, 2008
Presented by Kansas State University, the American Feed Industry Association, the National Grain and Feed Association

Advanced Pelleting Concepts
July 10-13, 2007
Presented by Kansas State University, the American Feed Industry Association, the National Grain and Feed Association

Advanced Feed Mill Management Short Course
April 8-11, 2008
Kansas State University

Feed Mill Maintenance
June 2-5, 2009
Kansas State University Feed Manufacturing Short Course
# 2009 Milling Short Courses

<table>
<thead>
<tr>
<th>IAOM-KSU:</th>
<th>Participants</th>
<th>Date</th>
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<tbody>
<tr>
<td><strong>Introduction to Flour Milling</strong></td>
<td>14</td>
<td>Jan. 26 – 30</td>
</tr>
<tr>
<td><strong>Managing the Milling Process</strong></td>
<td>10</td>
<td>Feb. 2 – 6</td>
</tr>
<tr>
<td><strong>Mill Processes I</strong></td>
<td>9</td>
<td>June 8 – 12</td>
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<tr>
<td><strong>Mill Processes II</strong></td>
<td>17</td>
<td>June 15 – 19</td>
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<td><strong>Subtotals</strong></td>
<td>50</td>
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<table>
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<tr>
<th>Buhler-KSU:</th>
<th>Participants</th>
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<tr>
<td><strong>Soft Wheat Milling</strong></td>
<td>4</td>
<td>July 13 – 17</td>
</tr>
<tr>
<td><strong>Executive Milling</strong></td>
<td>14</td>
<td>July 20 – 24</td>
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<tr>
<td><strong>Expert Milling</strong></td>
<td>6</td>
<td>August 3 – 7</td>
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<tr>
<td><strong>Subtotals</strong></td>
<td>24</td>
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<tr>
<td><strong>Totals</strong></td>
<td>74</td>
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GEAPS-KSU Distance Education
Program Objective

To organize and provide a professional development curriculum regarding the design and operation of grain handling and processing facilities that meet the seven GEAPS Core Competencies and deliver these courses via distance education to grain industry professionals around the globe.
GEAPS-KSU Distance Education Program - Participants

- Participants = 600 from 17 countries
- Individuals = 451
- Organizations = 224
- Companies with most enrolled:
  - CGB = 26
  - Cargill = 23
  - The Andersons = 22
  - Bunge / Bunge Milling = 20
- Most courses completed:
  - Jim Rossman, Kokomo Grain Co = 5
Center for Grain Handling Industry Operations @ K-State

• **Purpose:** The Center for Grain Handling Industry Operations at Kansas State University will serve as the primary partner to the U.S. (North American/ international!) grain handling industry in providing a current, complementary and comprehensive knowledge resource for the world of grain handling industry operations.

• **Partners:** GEAPS, Grain Handling & Processing Companies, Iowa State University, Purdue University, USDA-ARS GMPRC
Center for Grain Handling Industry Operations @ K-State - Strengths

- Successful GEAPS-KSU Grain & Biorefinery Operations Distance Education Program
- Leadership in new knowledge, technologies and education to the grain industry via its research and outreach programs on grain quality, handling, storage, pest management, facility design, etc
- Grain Elevator Manager short course via IGP
- Planned Certificate in Grain Handling Industry Operations
- Past leadership in grain industry safety particularly dust explosion research and education
- Food Protection and Defense graduate and distance education courses incl Agro Security, Food/Feed Safety
- Successful and existing Master of Agribusiness degree
- Proximity and close working relationship with USDA ARS Grain Marketing & Production Research Center (GMPRC)
- O.H. Kruse Feed Mill and Biorefinery Teaching and Research Center that will include a Grain Handling Facility and KSU’s proximity to GMPRC’s Grain Elevator & Pilot Bin Facility
Initial Priorities

• Grow our research enterprise
  – need to submit and obtain more grants from external sources
    • compete effectively for larger external grants
  – establish/strengthen strategic partnerships on and off campus
    • incl GMPRC, AIB, and internationally
  – need improved research facilities
    • esp labs and scale up
## Award Summary

07/01/08 - 06/30/09 (FY09 All 12 Months)

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<th>Proposals</th>
<th>Awards</th>
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<td>Plant Path.</td>
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<tr>
<td>Agronomy</td>
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<td><strong>Grain Science</strong></td>
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<tr>
<td>Animal Sci.</td>
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<td>Ag. Econ</td>
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<tr>
<td>Entomology</td>
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<td>Food Science</td>
<td>2</td>
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<tr>
<td>Horticulture</td>
<td>37</td>
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<td><strong>COA totals</strong></td>
<td>459</td>
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FY09 Final: $3,396,240 million

Information from Pre-Awards Services
Grain & Ingredient Storage & Handling

Dr. Leland McKinney
Dr. Subramanyam Bhadriraju
Dr. Dirk Maier

Identification, Quality, Preservation, Stored Product Protection, Segregation, Marketing, Rapid Analysis, Safety & BioSecurity
Milling & Extraction

Dr. Jeff Gwirtz
Dr. Hulya Dogan
Dr. Ekramul Haque
Prof. Chris Miller
Prof. Huseyin Dogan

Milling, Component extraction, Purification, Characterization, Dry-fractionation
Baking & Human Nutrition

Dr. Jon Faubion

Dr. Rebecca Miller

Prof. Dave Krishock

Formulation, Ingredients, Flour and Dough Quality, Process Improvement, Quality Testing, Prototype Testing
Basic Cereal Chemistry Research

Dr. Yong-Cheng Shi
Dr. David Wetzel
Dr. Ron Madl

Protein Chemistry, Starch Chemistry, Characterization, Measurement Technologies, Ingredients, Product Development
Feed & Animal Nutrition

Dr. Keith Behnke
Dr. Leland McKinney
Prof. Fred Fairchild
Dr. Sajid Alavi

Feed Manufacturing, Ration Formulation, Extrusion, Petfoods, Aquafeeds, Process Efficiency, Grinding, Mixing, Biorefinery Operation
Biobased Products & Bioenergy

Dr. X. Susan Sun

Dr. Sajid Alavi

Dr. Ron Madl

Dr. Praveen Vadlani

Nonfood Products, Biomaterials, Biopolymers, Enzymes, Fermentation, Extrusion, BioEthanol, Formulation & Prototype Development
Initial Priorities

• Grow our student enrollment
  – target recruitment of transfer and out-of-state undergraduate students
    • increase scholarship support
    • develop/implement recruitment plan
  – target recruitment of domestic & URM graduate students
    • need competitive stipends and GRA tuition waivers
    • expect excellence; recognize accomplishments
    • compete for NSF and USDA Needs Fellowships
  – need improved teaching facilities for feed, grain, biofuels and baking
Grain Science Undergraduate Student Enrollment
Fall 1998-2009 (Fall’09: 41%F vs 59%M)

Total = 200

Total = 184
Milling Science and Management Enrollment Sorted by Gender 1998-2009
(Fall’09: 16%F vs 84%M)

High = 115

F09 = 82
Bakery Science and Management Enrollment Sorted by Gender 1998-2009
(Fall’09: 81%F vs 19%M)

High = 63
Feed Science and Management Enrollment
Sorted by Gender 1998-2009
(F’09: 29%F vs 71%M)

High = 48
F09 = 39
New Student Enrollment - Fall 1997-2009

Fall of each Year

New Student Number

- Baking Science
- Feed Science
- Milling Science
- Total

F09 = 57
Keys to Increasing UG Student Enrollment in Grain Science & Industry

• Partnership btw K-State GSI and the Grain Industry
  – realize recruitment and retention of future employees starts by helping to fill the MSM, BSM and FSM pipelines at K-State

• Intentional and systematic recruitment plan
  – effective recruiting strategies; “Every one recruit one!”
  – Brains for Grains Recruitment and Scholarship Program

• Scholarship support
  – need to continue to grow scholarship pool

• Employment opportunities
  – Need internship opportunities and full-time job offers

➡ More Out-of-State Recruiting Events…

April 2010 – Chicago Area Agricultural High School
May 2010 – Mill Museum, Minneapolis, Minnesota
May 2010 – Cereal City, Battle Creek, Michigan(!?)
Brains for Grains Recruitment and Scholarship Program

1. Request a recruitment kit and commit to annually visit 5 local high schools and one area college
2. Adopt at least one student recruit and offer a part-time or summer job opportunity while enrolled locally
   - Mentor your student recruit for a grain industry career
3. Sponsor at least one student recruit taking classes at a local college and pay tuition for 6-12 KSU distance learning credits in MSM, BSM or FSM
   - Bring to campus at least once to meet our faculty and students
4. Sponsor at least one student recruit to enroll in MSM, BSM or FSM and fund “full ride” scholarship at K-State
5. Offer your student recruit(s) and our other students summer internships and full-time employment
6. Take advantage of complimentary K-State scholarships
   - Legacy Scholarship, Midwest Student Exchange Program, Diversity Scholarship
<table>
<thead>
<tr>
<th>Program</th>
<th>#</th>
<th>Amount</th>
<th>Average</th>
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<tr>
<td>BSM</td>
<td>45</td>
<td>$87,825</td>
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<td>MSM</td>
<td>38</td>
<td>$57,505</td>
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<tr>
<td>FSM</td>
<td>38</td>
<td>$30,525</td>
<td>$803</td>
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<tr>
<td>TOTAL</td>
<td>121</td>
<td>$175,555</td>
<td>$1,450</td>
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Grain Science Graduate Student Enrollment - Fall 1998-2009

(F’09: 50%F vs 50%M)

F09 = 45
Where are we headed?

- Aware of our **Weaknesses**, we are preparing to face encroaching **Threats**
  - Unfilled faculty and staff positions
  - Budget cuts; scholarship support; GRA tuition waivers
- Building on our **Strengths**, we are taking advantage of new **Opportunities**
  - New programs, services, partnerships, grants
- Forward and upward with optimism and anticipation
  - People (faculty, staff, students)
  - Vision, mission, priorities
  - Stakeholder support & Centennial Initiative
  - Updated Strategic Plan & CSREES Review
Centennial Celebration Initiative

• Increase scholarship support for our students
  – Goal: $50,000
    • $20,000 MSM; $20,000 BSM; $10,000 FSM
• Improve learning environment for our students
  – Goal: $500,000
    • Renovate Shellenberger class rooms (310, 311)
    • Establish a Student Collaborative Work and Study Area (319)
    • Move and expand computer laboratory (319)
• Establish Two (2) Endowed Faculty Chairs
  – Goal: $5,000,000
    • National funds to support *unique programs* with national impact
    • National funds to supply *future talent* for the grain industry
“Leaders & Knowledge for the Global Grain Industry”