



# Milling education review

**E**ducation is essential to maintaining and growing the international milling industry. While learning opportunities are available at trade shows and conferences, it's hard to duplicate the hands-on learning available at facilities designed specifically for intense training.

In this article, *World Grain* reviews some of the most prominent of these training programs, including a description of their history, specialties and future course offerings.

## IAOM

The International Association of Operative Millers' (IAOM) primary offerings are short resident courses presented in partnership with Kansas State University (KSU) and the recently revised Correspondence Course in Flour Milling. The resident courses are five days on the KSU campus and consist of Introduction to Flour Milling, Managing Mill Performance, Mill Processes I, and Mill Processes II. A Safety & HACCP Workshop for grain millers is also available, which is held jointly with AIB International and KSU. IAOM also offers

by Susan Reidy

## Opportunities available for hands-on training in science of milling at specialized facilities, institutions

Mill Maintenance I and II courses in alternating years. Certificates are awarded to all attendees completing each course.

In addition, IAOM offers its newly revised Correspondence Course in Flour Milling, completed in May 2012. Consisting of eight units and authored by experienced millers and industry experts, this course offers students the opportunity to earn a certificate with the successful completion of exams. Once the student completes all eight units, a diploma is awarded.

In revising the Correspondence Course in Flour Milling, there were new topics added to address contemporary issues



Participants attending Cigi's 45th International Grain Industry Program in July assess bread samples in the pilot bakery with Yvonne Supeene, Acting Head, Baking Technology, left. Photo courtesy of Cigi.

for grain millers. Special attention was given to food safety and sanitation, as well as best practices with regard to employee safety in the workplace. IAOM also is currently developing an Integrated Pest Management manual together with the North American Millers' Association (NAMA), which will serve as an important resource for the industry once the use of sulfuranyl fluoride is prohibited.

Based on a recent survey of students enrolled in the revised correspondence course, IAOM will look to enhance educational offerings in maintenance, grain buying and selling, plant management,

milling other grains, and milling equipment operation. Food safety and employee safety are always topics that are in demand and they will continue to be addressed at the IAOM Annual Conference & Expo, and in workshops and seminars.

IAOM said it is the only organization that keeps the education of millers as its primary objective. IAOM membership provides opportunities not only for education but also for collaboration, fellowship, and networking. The IAOM committees try to keep abreast of all issues arising in the milling industry and meet three times a year to discuss how the IAOM can help in getting the answers to the people who need them. For example, the Employee Relations Committee recently saw a need for studying the wages and benefits that millers receive across the U.S. A survey was conducted and results will be shared with the respondents.

The Food Protection Committee is developing an Integrated Pest Management manual in response to the possibility of losing one of the industry's most widely-used pesticides. The Education Committee sees to it that all short courses and the correspondence course contain the appropriate material. All of IAOM's standing committees work together to develop an optimal program for the annual conference. More information on IAOM programs is available at its website: [www.iaom.info](http://www.iaom.info).

### **KSU IGP**

The International Grains Program (IGP), which was created in 1978, utilizes technical training and assistance programs to educate international flour and feed millers, grain buyers, overseas government officials and other public and private-sector parties involved in grain procurement and use. The IGP is located in Manhattan, Kansas, U.S., and is part of the Department of Grain Science and Industry at Kansas State University (KSU).

Through the Department of Grain Science and Industry, students enroll in academic programs to pursue undergraduate degrees in milling, bakery and feed science and management, and M.S.

and Ph.D. degrees in grain science. In addition, three stand-alone minors in bakery science, feed science and grain operations were recently approved to be offered via distance for college credit. This educational addition is not only offered to current students, but to graduates and industry professionals as well.

The core curriculum at the IGP includes: professional training in flour milling and grain processing; feed manufacturing and grain management; and grain purchasing and risk management. Industry professionals from around the world come to IGP and KSU for continuing education via on-campus courses taught in state-of-the-art facilities and through distance education courses. In 2011, IGP offered 44 courses to 628 participants representing 43 countries. In 2012, KSU IGP has expanded its milling curricula by offering a six-week online distance learning training.

KSU IGP addresses the need for new knowledge and current information about new technologies in milling operations in its courses, as well as production efficiencies and cost management due to the increasing prices of grain commodities and energy. Food and feed safety (including HACCP and mycotoxins) have become topics of substantial interest to participants. KSU IGP has incorporated these topics into several of its courses and is also offering new stand-alone courses on these topics.

As a result of the Food Safety Modernization Act, IGP partnered with AIB International and the International Association of Operative Millers to offer HACCP training. In this course, participants learn the fundamentals of good manufacturing practices, sanitation schedules and HACCP programs specifically related to the flour milling industry. KSU IGP has also partnered with the American Feed Industry Association and the National Grain and Feed Association to offer HACCP training for the feed manufacturing industry. Participants completing those courses receive an official HACCP training certificate.

KSU's Department of Grain Science



Frank Bergen, milling technologist, leads a technical session in Cigi's pilot mill with participants of the 45th International Grain Industry Program in July.

and Industry is the only place in the world that offers the full spectrum of all educational opportunities in the field. Students can enroll in B.S., M.S. and Ph.D. academic programs, and industry professionals can enroll in continuing education programs through the IGP. Additionally, these educational opportunities are available in all delivery formats — on campus and online as well as for college credit and for continuing education credit. All of these opportunities are available solely from KSU and in partnership with key stakeholders.

The IGP Conference Center has recently updated the equipment in the facility, funded by the Kansas Soybean Commission, to better reach constituents and improve teaching capabilities. The updated technology in the Deyoe Auditorium allows dual projection, which will be fully utilized with international presentations where both the English and translated presentation can be simultaneously projected. In addition, in both the auditorium and the Ward Boardroom, video conferencing systems were installed, which will provide a platform to utilize for distance education.

The systems allow IGP to bring presenters into the classroom virtually as

well as capture and project classroom activities externally. The boardroom also has a state-of-the-art Smart touch-screen, allowing for a more interactive teaching experience. In addition, the recent upgrade included a remodeling of the multi-purpose room, fully integrating technology into the room and adding additional teaching space to the growing Conference Center facility. The Kansas Grain Sorghum Commission provided the funds to purchase furniture, window treatment and carpet needed to convert this space into a fully functional classroom.

More information is available at <http://www.grains.k-state.edu/igp/>.

#### BÜHLER TRAINING CENTER

The Bühler Training Center in Uzwil, Switzerland offers courses for the operating staff in the milling industry. The education is based on short but intensive courses that last for one to three weeks. In addition to standard courses, the training center offers individually designed courses according to specific customer needs. This training is done at the Bühler Training Center or at the customers' facility.

Bühler said it teaches operational staff how to run a profitable flour mill and how a grain milling plant can make best use of

the raw material at lowest operation cost. The courses are designed and offered for staff with different skills and levels.

Course offerings include: Milling Technology: basic, advanced and expert level; Durum Milling; Maize Milling Technology; Oat Processing; Mechanical Maintenance; Electrical Maintenance; Electrical Maintenance for Bagging Plants; Advanced Plant Automation; Fluting Course; Laboratory; Flour Sales and Grain Processing for the Ethanol Industry. The center recently added From Wheat to Bread.

Most of these courses can be taught in German, English, French, Spanish and Italian. Courses in other languages are assisted by interpreters.

Bühler also offers milling courses for executives. These courses are designed for management members of the milling industry who do not have a profound technical background in milling.

Bühler said its educational programs are focused on practical “hands-on” training as well as classroom teaching.

“We are offering the ideal balance between the two with the help of an operational school mill, a fully equipped machine park, a workshop for mechanical as well as electrical installations and maintenance,” Bühler said. “With those facilities we cover what is needed for successful teaching.”

#### OCRIM

Ocrim S.p.A. organizes a variety of educational courses to educate the milling industry at its Milling Training Center in Cremona, Italy. Ocrim first started educating the milling industry at a facility outside Cremona in 1965. More than 2,800 students have been trained to become chief millers, laboratory analysts and maintenance foremen. The courses attract students from across the world.

Ocrim offers a wide range of courses that range from mechanical, electrical maintenance, automation, including specific courses for millers and laboratory. The courses are continuously updated with the newest technologies and to meet new market demands.

Various topics are covered from the

simple maintenance of a machine to more difficult questions related to the sustainability/resource management inside the milling complex, including sanitation, personnel and food safety and product traceability.

Ocrim also can provide courses dedicated to customers' specific requirements. Recently, Ocrim started offering dedicated courses held directly on customers' sites to face the specific requirements of each plant and also to teach the personnel involved in the works.

Ocrim is always looking for new ideas to improve its efficiency and benefits that it can give to its customers. Consequently, Ocrim is always working to keep its school at a high quality standard in the machinery used at the school mill and in the laboratory.

In 2011, investments were made on the general structures of the school, and in early 2012 Ocrim inaugurated the new

conference room inside the school. It can be used by all customers for technical meetings and visits to the company.

### NABIM

Since its formation in 1878, the National Association of British and Irish Millers (nabim) has been committed to the development of skilled millers and has placed a high priority on milling training. For more than 100 years, nabim has been at the forefront of technical education in flour milling, first within the U.K. and Ireland, and since the mid-20th century, across the world.

Nabim's seven-module distance learning program has been offered annually for many years. There is a rolling program of textbook updates, keeping the material fresh and relevant. Students may study the modules in any order and combination. They are allocated a tutor who will comment on their

coursework during the year. Each module has a written examination at the end of the course. Upon successful completion of all seven modules, they receive the nabim Advanced Certificate.

Once every three years, in conjunction with Campden BRI and Bühler Training Centre, nabim also offers U.K. millers an Advanced Milling Diploma program, in three units. The first two, "technical" and "operations," involve residential weeks at its partners' training facilities. The third is a research project, approved by their employers and assessed independently.

Nabim generally runs two or more short conferences every year aimed at either technical education or more general management development.

nabim has been working with government bodies to develop new proficiency qualifications, providing assessment of practical competence as well as of knowl-

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edge and understanding. These are likely to be the successors of its flour milling craft skills certificate, a vocational qualification, which was much-used during the late 1980s and 1990s and is still used by some U.K. companies today.

Designed and delivered by millers for millers, nabim's distance learning program provides students with expert tutor support and up-to-date course material providing a complete overview of the milling process and industry, backed up by rigorous examination.

Nabim has produced one online training film, using video, demonstration and animation on part of the milling process, and another two will be completed this fall. They will be available for viewing through nabim's new training-dedicated website, [www.nabimtraining.com](http://www.nabimtraining.com). The films help students understand what is going on inside the closed milling process in a way which books cannot, and it often impractical for companies to demonstrate in their own mills.

More information about nabim's offerings are available at <http://www.nabim.org.uk/>.

## NCI

Located on the campus of North Dakota State University in Fargo, North Dakota, U.S., the Northern Crops Institute (NCI) specializes in programs that focus on baking, crop quality, pasta processing, extrusion technology, milling technology, risk management, and feed manufacturing. Its mission is to help develop and maintain markets for the commodity and specialty crops that are grown in Minnesota, Montana, North and South Dakota. In addition to regular courses, new programs and technical services are developed to address new trends in the food and feed industries.

The NCI staff regularly responds to issues that participants mention during the courses. If their company is working with a certain ingredient or process that NCI is not teaching about, material or a speaker on the topic may be added. Each participant at the educational courses is asked to complete an evaluation that

asks questions about the course content, quality of speakers, comfort of the facility, and helpfulness of the staff. Based on these evaluations and input from its advisory boards, NCI said it constantly revamps course content, lab equipment, and technology to stay at the forefront of the food and feed industry.

The number of NCI's customized courses for individual companies or organizations is increasing. These courses are confidential and provide an arena where the participants can openly discuss issues that are facing their company. Sometimes in regular courses where several companies are represented, participants may not want to discuss the problems that they are facing because their competition is in the same room. A customized learning experience that is limited to just one company's personnel can be very effective.

Many of NCI's courses and programs are requested by U.S. market promotion organizations, such as the U.S. Wheat Associates, U.S. Grains Council, U.S. Soybean Export Council, U.S. Dry Bean Council, U.S.A. Dry Pea and Lentil Council and others.

NCI staff presented the new "Rheology of Wheat and Flour Quality" course in June. It was developed in response to feedback from the milling and baking industries that indicated a need for their personnel to have more training on the latest rheological equipment. This knowledge will help them explain to their customers the differences in quality and how to adjust for those variations. Each participant had the opportunity to operate the rheological instruments and interpret the analytical tests. They focused on tests for gluten content, falling number, flour color, ash content, moisture, starch damage, speck count, protein and starch.

With the passage of the Food Safety Modernization Act, there have been many questions about the regulations that could come down on the industry. Members of the feed industry have expressed interest in learning more about how they can ensure meeting the new standards. In response, NCI has hosted

several courses that address developing a Hazard Analysis & Critical Control Points (HACCP) plan.

NCI staff travels throughout the world to provide educational programs and technical consulting services to assist food and feed companies in the utilization of northern-grown crops. In 2011-12, the staff presented courses and technical consulting in Dominican Republic, Mexico, Thailand and Turkey.

NCI's grain procurement and pasta manufacturing courses attract the most stable enrollments. They have both been offered annually since the NCI opened in 1983. The Grain Procurement Management for Importers and the Advanced Grain Procurement Strategies courses teach grain merchandisers how to make more effective purchases while managing their risk. An addition to NCI's grain procurement courses is the availability of the new electronic trading room developed by North Dakota State University's Agribusiness and Applied Economics Department, under the direction of William Wilson, Ph.D. The high-technology trading room, which includes simulations software from Trading Technologies, will be used by the grain procurement participants to analyze markets in real-time and illustrate trade simulations. NCI, along with many major agribusinesses and commodity organizations, provided additional funding for the room.

The Pasta Manufacturing courses are very unique, since no other U.S. organization offers pasta processing courses. NCI's pasta short courses, presented annually since 1984, showcase the high quality durum that is grown in the Northern Plains region. NCI's pasta courses focus on the manufacture of traditional Italian-style pasta. A near record enrollment attended the 2012 Pasta Production and Technology Short Course. Some years, NCI has offered multiple pasta courses due to the tremendous demand both domestically and internationally.

NCI constantly updates the equipment and technology in its labs. The following equipment has been added at NCI in 2012:

- Brabender Extensograph (measures flour quality)
- Brabender Farinograph (tests wheat gluten quality)
- Chopin Alveograph (measures flour quality)
- Chopin Consistograph (tests wheat gluten quality)
- Chopin Rheofermentometer (measures fermentation capability of dough)
- LECO FP 628C Nitrogen Determinator (protein analyzer)
- Omcan FMA (TR50) Italian Commercial Electric Pasta Machine (restaurant-sized pasta production)
- RMS Roller Grinder (controls size reduction process)
- Rondo Dough Sheeter (sheets dough to precise thickness).

More information and registration forms are available on NCI's website ([www.northern-crops.com](http://www.northern-crops.com)).

### CIGI

The Canadian International Grains Institute (Cigi), Winnipeg, Manitoba, Canada, provides customized educational programs and technical expertise. Since 1972, more than 34,000 people from the grain, oilseed, pulse and special crop industries from 115 countries have participated in Cigi programs and seminars.

Funding is provided by Agriculture and Agri-Food Canada and the Canadian Wheat Board (CWB). Additional funding and support is provided by other sectors of the agriculture industry.

This year marks two significant milestones in Cigi's history. First, Cigi is celebrating its 40th anniversary and its successes in continuing to create profitable opportunities for Canada's field crops. The second milestone is the transition to an open market for western Canadian wheat, durum and barley effective Aug. 1, as a result of changes to the Canadian

Wheat Board's single desk mandate. Given its long history of delivering programs to customers on behalf of the Canadian Wheat Board and other industry members regarding Canadian field crops, Cigi is in a unique position to respond with relevant programming during this time of change.

Earlier this year, Cigi established two advisory committees, one comprising seven farmers from Western Canada and the other a group of marketers formed by the Western Grain Elevators Association to provide advice and guidance on Cigi's programming activities for western Canadian wheat, durum and barley. This activity is in addition to Cigi programs focusing on other field crops and areas of interest.

Cigi delivers customized programs focused on the following areas of expertise: Asian noodles, steamed bread; baking; biofuels; feed; grain industry overview; grain marketing; grain qual-

Jiangsu Zhengchang

ity testing and evaluation; industrial applications; milling; pasta processing; and pulse processing.

Programs can be developed for a specific company, region or country by field crop, end use, or subject. Cigi programs are delivered at Cigi or offsite (both in Canada and offshore) and can be offered in the language of the customer.

Participants attending programs at Cigi spend time in Cigi's state-of-the-art facilities featuring a pilot flour mill, pilot and test bakeries, pilot noodle plant, pilot pasta and extrusion plant, pulse processing and specialty milling facility, analytical and food testing laboratories, and a portable pilot biodiesel plant.

Cigi works with more than 400 organizations and individuals from the Canadian grain industry, who along with Cigi staff, share their expertise through presentations, practical demonstrations, hands-on training and facility tours.

The majority of Cigi's programs are funded by farmers, grain industry partners, agricultural commodity groups, and government organizations and agencies. Cigi also offers open enrolment and customized training on a fee-for-service basis.

Upcoming open enrollment courses include a Wheat Milling Technical Short Course, Jan. 7-9, 2013, and an Asian Noodle Technology Short Course, Feb. 12-14, 2013. Cigi's next Grain Industry Overview Course is scheduled for Nov. 5-9. Details about these courses can be found on Cigi's website at [www.cigi.ca/](http://www.cigi.ca/).

Given the move to an open market in Western Canada, there has been increasing interest from industry in recent months seeking Cigi's knowledge of world markets and what customers in various regions of the world want from Canadian wheat and durum. There has also been heightened interest in Cigi's Grain Industry Overview Course and its focus on the objectives and operations of key players in the industry.

Cigi has delivered a number of customized fee-for-service courses for grain companies and industry members to address their particular needs or ques-

tions related to changes occurring in the Canadian grain industry, particularly what customers expect from Canadian wheat and durum with respect to milling and various baked, pasta and noodle products. At the same time Cigi's upcoming program schedule includes technical programs on site at Cigi and overseas targeted to key customers that will provide them with interactive, hands-on programming related to the primary and secondary processing of Canadian field crops applicable to their end-product requirements. Discussions are under way with some international customers who have expressed interest in building longer-term research and training agreements with Cigi based on Cigi's knowledge of how Canadian field crops are used in food processing and industrial applications around the world.

Cigi's currency of knowledge of the Canadian grain industry, Canadian field crops, international customer requirements and end-product applications continue to be the distinguishing factors in its ability to provide relevant programs for industry. Cigi's technical expertise and equipment enable Cigi to provide training in milling, baking, noodle and pasta production, cooking extrusion and laboratory analytical technology. As well, Cigi is able to run full sensory evaluation of end products produced in its pilot facilities that reflect customer preference and satisfaction indexes. This knowledge, built from 40 years of experience working with over 36,000 participants from 115 countries, enables Cigi to customize courses according to the particular needs and interests of customers and industry members. This knowledge, combined with the ability to operate technical equipment in a manner that is consistent with food processors all over the world, enables Cigi to create a comprehensive learning experience.

During the past year, Cigi upgraded its classroom facilities with a new state-of-the-art sound system, high-definition projectors and touch screen monitors to provide a powerful multimedia environment that enhances the learning experi-

ence for participants while in classroom sessions. The upgrades also provide presenters with access to more tools and options to deliver interactive, collaborative presentations during Cigi programs.

## SMS

Since 1957, when the Swiss School of Milling (SMS) was founded, the main focus has been on teaching students in milling. This means they are trained in theory as well as in practice. The school's students are all over the world in leading positions in the milling industry. Its close link to the milling industry guarantees that the school is always up to date in machine technology as well as in flow sheet. As a private school, certified by an external body (EduQua), the school is prepared to implement new knowledge.

The school in St. Gallen, Switzerland is the only one in Europe focused on practical milling. People attending the school want to learn everything about milling, how to improve the yield, the mill, etc. Topics like sustainability, and personal development are taught as well because it is important for students. Quality assurance and food safety also are taught.

The school's course is divided into a six-month correspondence course and a six-month main course. The correspondence course covers the basic knowledge that is required for optimal preparation for the main course. Students can acquire the knowledge in individual subject groups at home while still working. The necessary materials will be sent to them by the school. Students have to reply to questions in the various subject areas. The answers will be rated and included in the final rating. The time required for the correspondence course is about six to 10 hours a week, depending on a student's prior knowledge.

The six-month main course is held at the school. Knowledge of the individual subjects is expanded in the main course. During the main course, four practice afternoons will be held weekly to support



Satake personnel and students pose in front of Satake USA's headquarters. Photos courtesy of Satake USA.

classroom work. They include practical exercises in the laboratories and in the modern school mill. This will ensure high relevance of training to practice.

Upon successful completion of the course, students will be awarded a diploma certifying them as "Milling Technologist SMS."

The school was recently moved to another building, offering students a nice facility to complete their studies.

More information on SMS is available at <http://www.sms-sg.ch/home-en.html>.

## SFT

The Swiss Institute of Feed Technology (SFT), Uzwil, Switzerland, was founded in 1979 by the then-owner of Bühler AG, Dr. René Bühler. Its purpose was to impart primarily practice-orientated specialist knowledge on feed production to professionals from the feed manufacturing and related industries.

The showcase of the SFT is the diploma course on feed manufacturing technology. It includes a preparatory course on a correspondence basis and an intensive course at the SFT headquarters. The "Concept 2012" divides the course

into two blocks, which makes absence from work even shorter. The courses are taught in German and English in three-year intervals. The main emphasis is placed on flow sheet and process technology, but also electrical engineering, automation, animal nutrition and feed science. Students who successfully complete the course are awarded a diploma as feed production engineer.

SFT also offers two- to 10-day short courses in different languages, if required with simultaneous translation. More information is available at [www.sft-uzwil.ch](http://www.sft-uzwil.ch).

SFT can organize customer or plant-specific courses at the institute's site or at the customer's location. It can also act as a neutral consultant for plant optimization and alterations, carrying out inspections and conducting homogeneity and cross-contamination tests.

Given its close relationship with Bühler, SFT's technological know-how and equipment in the training center will be permanently updated to the current state. This allows students to understand, apply and operate state-of-the-art technologies and processes in feed production plants, SFT said.

## SATAKE RICE MILLING COLLEGE

Satake USA's Rice Milling College, located at its facilities in Stafford, Texas, U.S., offers three-day seminars on the management and operation of modern rice mills. Courses provide hands-on experience using equipment installed in the test center. The college combines the efforts of universities, Satake engineers and industry experts to provide training to the rice milling industry.

In mid-April, Satake hosted 52 guests from Australia, the Dominican Republic, Costa Rica, Mexico, Honduras, Venezuela and the U.S for a three-day course.

The Rice Milling College program covered all aspects of rice milling such as process technologies, quality control, practical tests with full-scale machines, problem-solving training sessions, including social evening events and other topics. The instructors included well respected experts with years of industry experience.

Satake's Rice Milling College featured high-profile guest speakers from across the rice industry: Steve Rocca, Vogel Sales Engineering; Scott Lindsey, Riceland Foods; Jennifer Kalfsbeek, Sun Valley Rice; and Jim Bond, Philip Rahm International.

Satake President & Chief Executive Officer Junjiro Naoki welcomed the participants and expressed his high satisfaction that the annual Satake Rice Milling College has been growing every year. From Satake's Cereal Division, Chuck Vincent, Thomas Kock and Tony Lopez all made presentations to the assembled students.

Satake provided professional simultaneous Spanish translators for its guests who needed this service.

Participants utilized the following Satake equipment at the company's test mill to augment their education: the New Water Polisher KB75 and New Color Sorter SSM, the Abrasive Whitener VTA-10, Friction Whitener VBF-10 and laboratory equipment. WG

We want to hear from you — Send comments and inquiries to [worldgrain@sosland.com](mailto:worldgrain@sosland.com). For reprints of WG articles, e-mail [reprints@sosland.com](mailto:reprints@sosland.com).