GMPRC
GRAIN MARKETING AND PRODUCTION RESEARCH CENTER

RESEARCH Kernels

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- **New 800 Number.** Now it is easier for our customers to reach us using our new 800 number **(1-800-627-0388)**. You may reach GMPRC scientists directly using the numbers provided with each article or you can use our new 800 number.

- **Comparison of Lipids from Japanese and Australian Noodle Flours.** Non- starch and free lipids were extracted from fifteen Japanese commercial flours samples (six for alkaline noodles and nine for salt noodles) and three Australian Soft White Wheat samples. The non-starch lipids were separated into nonpolar, glycolipid, and phospholipid fractions. The average free lipid content of the nine Japanese salt noodle flours was 0.94%. The average free lipid content of the three Australian samples was 0.98% and that for the six alkaline noodles was 0.77%. The non-starch lipid contents were 1.51%, 1.46%, and 1.26% for the Japanese salt noodle, Australian soft white, and Japanese alkaline noodle flours respectively. These data indicate that it may be possible to use the different lipid contents to distinguish between wheat samples that are good for salt noodles and those that are good for alkaline noodles. (Okkyung Chung, phone: 785-776-2703, email: okchung@usgmrl.ksu.edu)

- **Red Flour Beetles Given a Food Source Survive Longer after Exposure to Cyfluthrin.** Adult red flour beetles were exposed to concrete treated with cyfluthrin wettable powder for times ranging from 15 to 120 minutes and then held in Petri dishes that were either empty or that contained 1 gram of flour. Until week six, survival of beetles exposed for over 30 minutes and not given food was less than 5%. After week six, survival increased at exposure intervals above 30 minutes and, by week 16, survival usually exceeded 50%. In contrast, survival of beetles provided with flour exceeded 80% by week six. These results demonstrate that residual food and trash material within storage structures may have a negative impact on the efficacy of residual insecticides such as cyfluthrin. (Frank Arthur, phone: 785-776-2783, email: arthur@usgmrl.ksu.edu)

- **Penetration of Heat into Cereal Grain Processing Equipment During Heat Treatment to Control Insects.** Heat penetration into five kinds of cereal grain processing equipment was

measured during full plant heat treatment. Temperatures inside the equipment were similar to those recorded outside of the equipment regardless of whether the equipment was opened or closed. The length of time that the temperature was above 50o C tended to be slightly longer in equipment that was closed when compared to equipment with covers removed because heat was retained inside the closed equipment. (Alan Dowdy, phone: 785-776-2719, email: dowdy@usgmrl.ksu.edu)

- **Novel Methods Developed to Separate Prolamin Storage Proteins.** Prolamin storage proteins of maize and sorghum have been difficult to analyze because of their tendency to clump together in water and their complexity. Detergents were used to improve the separation of these proteins using capillary electrophoresis. These results will make it possible to identify maize and sorghum cultivars based on their different protein patterns in a fashion that is similar to what can now be done in wheat. (George Lookhart, phone: 785-776-2736, email: george@usgmrl.ksu.edu)

- **Management Practices and Seed Treatments That Can Lower the Chances of Wheat Leaf Rust.** Estimated annual wheat losses due to leaf rust and other Septoria diseases from 1976 to 1997 are 5.3% and range from a high of 14% to a low of 1%. Results show that any management practice that reduces the level of spore inoculum that survives the winter will decrease the level of rust infection in the spring. Treatment of seeds with the systemic triazole fungicides, triadimenol and difenoconazole, was an effective means of decreasing spore concentrations to 10 to 25% the levels contained on non-treated seeds. (Merle Eversmeyer, phone: 785-532-6168, email: mge@rust.pp.ksu.edu)

New Scientists Join GMPRC Staff to fill Vacancies Due to Retirement and Relocation:

- **Jeff Lord.** Jeff Lord joined the Biological Research Unit in August. He obtained a Ph.D. at the University of Florida with specialization in insect pathology. He held postdoctoral and research associate positions in insect pathology with ARS in Gainesville, Florida, and with Boyce Thompson Institute for Plant Research in Ithaca, New York, and Goiania, Brazil. Jeff comes to GMPRC with eight years of experience as a Senior Scientist with start up companies that developed commercial mycoinsecticides (fungi for insect control). Initially his research program at GMPRC will concentrate on the development of methods and strategies to improve the efficacy of mycoinsecticides in stored products, the study of protozoan diseases on grain beetles, and the search for new bacterial diseases of stored product pests. His goal will be to develop new methods for controlling insect pests using fungi, bacteria, and other naturally occurring organisms. (Jeff Lord, phone: 785-776-2705, email: lord@usgmrl.ksu.edu)

- **Brenda Oppert.** Brenda Oppert joined the Biological Research Unit in June. She received a B.S. and M.S. in Biology at the University of Texas at El Paso and a Ph.D. in Biochemistry at Kansas State University. From 1993 to 1998, she held postdoctorate and research associate positions at GMPRC where she worked on the mechanisms of insect resistance to bacterial toxins such as those produced by Bacillus thuringiensis. Brenda's research will continue to focus on

understanding how insects develop resistance to biopesticides and other control measures. (Brenda Oppert, phone: 785-776-780, email: oppert@usgmrl.ksu.edu)

- **Brad Seabourn.** Brad Seabourn accepted a new position as a research scientist in the Grain Quality and Structure Research Unit in May. He received B.S. degrees in both Animal Science and Chemistry and a M.S. degree in Grain Science from Kansas State University. Brad is currently a Ph.D. candidate in Grain Science at Kansas State University. He has worked at GMPRC since 1982, first as a research assistant, then as a laboratory technician, and now as a Food Technologist and Coordinator of the Hard Winter Wheat Quality Laboratory. Brad's current research interests are in the study of dough rheology using near-infrared spectroscopy, as well as the application of this technique to the prediction of end-use quality in wheat flour and whole grain wheat. (Brad Seabourn, phone: 785-776-2751, email: brad@usgmrl.ksu.edu)

- **Michael Tilley.** Michael Tilley joined the Grain Quality and Structure Research Unit in June. He received a B.S. in Biology from the Richard Stockton College of New Jersey and a Ph.D. from Kansas State University in Microbiology. Following a brief period of postdoctoral work at KSU, he was awarded a Hitchings-Elion Postdoctoral Fellowship from the Burroughs-Wellcome Fund to conduct research at the University of London School of Tropical Medicine and Hygiene, and the Department of Veterinary Molecular Biology, Montana State University. In 1996, he returned to a postdoctoral position in the Department of Grain Science and Industry at Kansas State University where he worked on the development of methods to characterize granule bound starch synthase (GBSS) enzymes of wheat. Mike will be conducting research to identify and evaluate interactions between biochemical components (starch, protein, and lipids) that determine the functional properties of wheat flour. (Michael Tilley, phone: 785-776- 2759, email: mtilley@usgmrl.ksu.edu)