

Biographical Sketch

Milford A. Hanna

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Education

B.S. 1969 Pennsylvania State University, Agricultural Engineering
M.S. 1971 Pennsylvania State University, Agricultural Engineering
Ph.D. 1973 Pennsylvania State University, Agricultural Engineering

Employment

- Director, Industrial Agricultural Products Center, University of Nebraska, 7/1/91- present
- Professor, Biological Systems Engineering / Food Science and Technology, University of Nebraska, 7/1/85 - present
- Associate Professor, Agricultural Engineering / Food Science and Technology, University of Nebraska, 7/1/79 - 6/30/85
- Assistant Professor, Agricultural Engineering / Food Science and Technology, University of Nebraska, 7/15/75 - 6/30/79
- Assistant Professor, Agricultural Engineering, California Polytechnic State University, 9/15/73 - 7/15/75

Honors and Awards Received

- Kenneth E. Morrison Distinguished Professor of Food Engineering, 1990 to present
- Engineer of the Year, Nebraska Section of the ASAE, 1991
- Gamma Sigma Delta Research Award, University of Nebraska, 1991
- Member of the Year, Mid Central Conference of ASAE, 1992
- Award for Agricultural Excellence in Recognition for Contributions to the Advancement of Agriculture, National Agri-Marketing Assoc.-Midlands chapter, 1996
- ASAE Fellow, 1996
- College of Engineering and Technology Faculty Research Award, 1997
- College of Engineering and Technology Student Advisory Board Outstanding Advisor Award, 2004

Memberships in Professional Organizations

ASAE
Association for Advancement of Industrial Crops
Bioenvironmental Polymers Society
Gamma Sigma Delta - Academic Honor Society
The Honor Society of Phi Beta Delta

Research Interests

My research efforts have resulted in approximately 250 peer-reviewed publications. Five patents have been awarded. My primary research emphasis has been in the area of extrusion process engineering. Other interests that have resulted in significant grant support and/or publications include biodiesel, biodegradable lubricants, physical properties of materials, biodegradable polymers, nanotechnology, and soybean harvesting. Grant funding of the order of several million dollars has been received in the above research areas from a combination of federal programs (USDA and DOE), state and national commodities boards (corn, soybeans and sorghum), and companies.

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Publication Record (past four years)

- Bullerman, L., A. Bianchini, L.S. Jackson, J. Jablonski, M.A. Hanna and D. Ryu. 2008. Reduction of Fumonisin B1 in Corn Grits by Single-Screw Extrusion. *Journal of Agricultural and Food Chemistry*. 56(7): 2400-2405.
- Kumar, A., L. Wang, Y. Dzenis, D. Jones, and M.A. Hanna. 2008. Thermogravimetric characterization of corn stover as gasification and pyrolysis feedstock. *Biomass and Bioenergy*. 32:460-467.
- Lee, S. and M.A. Hanna. 2008. Effects of extrusion variables on organoclay interclation and properties of tapioca starch-poly (lactic acid) nanocomposit foams. *International Polymer Processing*. Submitted.
- Lee, S. Y., H. Chen and M.A. Hanna. 2008. Preparation and characterization of tapioca-starch-poly (lactic acid nanocomposite foams by melt intercalation based on clay type. *Industrial Crops and Products*, 28: 95-106.
- Lee, S. Y., and M. A. Hanna. 2008. Tapioca-starch-poly (lactic acid) – Cloisite 30B nanocomposite foams. *Polymer Composites*. In press.
- Pushpadass, H.A., D.B. Marx and M. A. Hanna. 2008. Effects of extrusions temperature and plasticizers on the physical and functional properties of starch films. *Starch Journal*. Accepted.
- Pushpadass, H.A., R.W. Weber, and M.A. Hanna. 2008. Expansion, morphological, and mechanical properties of starch-polystyrene foams containing various additives. In press.
- Pushpadass, H.A., Marx, D.B., R.L. Wehling and M. A. Hanna. 2008. Extrusion and characterization of starch films. *Cereal Chemistry*. Accepted.
- Pushpadass, H.A., G. Suresh Babu, R.W. Weber and M.A. Hanna. 2008. Extrusion of starch-based loose-fill packaging foams: Effects of temperature, moisture and talc on physical properties. *Packaging Tech and Sci*. 21: 171-183.
- Xu, Y, M.A. Hanna and S.J. Josiah. 2008. Synthesis and characterization of hazelnut oil-based biodiesel. *Industrial Crops and Products*. Submitted.
- Fernando, S. and M.A. Hanna. 2007. Lubricity characteristics of selected vegetable oils, animal fats and their derivatives. *Journal of Applied Engineering* 23(1): 5-11.
- Ganjyal, G., Q. Fang and M.A. Hanna. 2007. Freezing points and small scale deicing tests for salts of levulinic acid made from grain sorghum. *Bioresource Technology* 98(15): 2814-2818.
- Ganjyal, G., R Weber and M.A. Hanna. 2007. Laboratory composting of extruded starch acetate and polylactic acid blended foams. *Bioresource Technology* 98: 3176-3179.
- Kumar, A., G.M. Ganjyal, D.D. Jones and M.A. Hanna. 2007. Modeling residence time distribution in a twin-screw extruder as a series of ideal steady-state flow reactors. *Journal of Food Engineering*

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84:441-448.

- Kumar, A., G.M. Ganjyal, D.D. Jones and M.A. Hanna. 2007. Experimental determination of longitudinal expansion during extrusion of starches. *Cereal Chemistry* 84(5): 480-484.
- Lee, S.Y., Y Xu., and M.A. Hanna. 2007. Tapioca starch –polylactic acid-based nanocomposite foams as affected by type of organo clay. *International Polymer Processing* 22(5): 429-435.
- Mesquita, C.M., R. Weber, M.A. Hanna and N.P. Costa. 2007. Crop and harvesting characteristics affecting physiological qualities of soybeans – Part II. *Journal of Applied Engineering* 23(4): 433-438.
- Mpagalile J. H, M.A. Hanna and R. Weber. 2007. Seed oil extraction using a solar powered screw press. *Industrial Crops and Products* 25: 101-107.
- Xu, Y., and M.A. Hanna. 2007. Effect of eggshell powder as nucleating agent on the structure, morphology and functional properties of normal corn starch foams. *Packaging Science and Technology* 20:165-172.
- Xu, Y.X., M.A. Hanna, and S.J. Josiah. 2007. Hybrid hazelnut oil characteristics and its potential olechemical application. *Industrial Crops and Products* 26: 69-76.
- Xu, Y., and M.A. Hanna. 2007. Synthesis and characterization of tripolyphosphate (TPP) cross-linked chitosan capsules using electrospraying technique. *Journal of Microencapsulation* 24(2): 143-151.
- Ganjyal, G., S. Panuwat, M.A. Hanna, A. Noomhorm and D. Jones. 2006. Modeling extrusion of rice flour and rice starch by neural networks. *Cereal Chemistry* 83(3):223-227.
- Guan, J.J. and M.A. Hanna. 2006. Selected morphological and functional properties of extruded starch cellulose foams. *Bioresource Technology* 97:1716-1726.
- Guan, J.J. and M.A. Hanna. 2006. Physical, mechanical and macromolecular properties of starch acetate during extrusion foaming transformations. *Industrial Engineering and Chemistry Research*. 45(11):3991-4000.
- Hanna, M., J. Guan and Y. Xu. 2006. Starch-based biodegradable packaging. (Chapter). *Encyclopedia of Agricultural, Food and Biological Engineering*
- Kim, K.M., J.A. Ko, J.S. Lee, H.J. Park and M.A. Hanna. 2006. Effect of modified atmosphere packaging on the shelf life of coated, whole and sliced mushrooms. *Lebensmittel-Wissenschaft und Technologie*. 39:364-371.
- Kim, K.M., C.L. Weller and M.A. Hanna. 2006. Properties of chitosan films as a function of pH and solvent type. *Journal of Food Science* 3: E119-E124.
- Kumar, A., G.M. Ganjyal, D.D. Jones and M.A. Hanna. 2006. Digital image processing for

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- measurement of residence time distribution in a laboratory extruder. *Journal of Food Process Engineering* 75:237-244.
- Mesquita, C.M., M.A. Hanna and N.P. Costa. 2006. Crop and harvesting characteristics affecting field losses and physical qualities of soybeans – Part I. *Applied Engineering in Agriculture* 22(3):325-333.
- MpagaliE, J., R. Weber and M. A. Hanna. 2006. Design and testing of a solar photovoltaic operated multi-seeds oil press. *Renewable Energy* 31:1855-1866.
- Seker, M. and M.A. Hanna. 2006. Sodium hydroxide and trimetaphosphate levels affect properties of starch extrudates. *Industrial Crops and Products* 23(3):249-255.
- Wang, L., D. D. Jones, C.L. Weller and M. A. Hanna. 2006. Modeling of transport phenomena and melting kinetics of starch in a co-rotating twin screw extruder. *Advances in Polymer Technology* 25(1):1-19.
- Xu, Y., and M. A. Hanna. 2006. Electrospray encapsulation of water-soluble protein with polylactide. Effects of formulations on encapsulation efficiency and release. *International Journal of Pharmaceutics* 320 (1-2): 30-36.
- Xu, Y., M. Skotak, and M.A. Hanna. 2006. Electrospray encapsulation of water-soluble protein with polylactide. Effects of formulations and process on morphology and particle size. *Journal of Microencapsulation* 23(1):69-78.
- Xu, Y., X. Ren and M.A.Hanna. 2006. Chitosan/clay nanocomposite film preparation and characterization. *Journal of Applied Polymer Science*. 99:1684-1691.
- Fernando, S., and M.A. Hanna. 2005. Phase behavior of the ethanol-biodiesel-diesel microemulsion system. *Transactions of the ASAE* 48(3):903-908.
- Fernando, S., and M.A. Hanna. 2005. Design and development of a threshing chamber and pneumatic conveying and cleaning units for soybean harvesting. *Transactions of the ASAE* 48(5):1681-1688.
- Ganjyal, G., M.A. Hanna and D.S.K. Devadattam. 2005. Processing of sapota (sapodilla): Powdering. *Journal of Food Technology* 3(3):326-330.
- Guan, J.J., and M.A. Hanna. 2005. Selected morphological and functional properties of extruded acetylated starch-poly(lactic acid) foams. *Industrial Engineering and Chemistry Research* 44(9):3106-3115.
- Guan, J., K. Eskridge and M. A. Hanna. 2005. Acetylated starch-poly(lactic acid) loose-fill packaging materials. *Industrial Crops and Products* 22(2):109-123. .
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- Mesquita, C.M., M.A. Hanna and N.P. Costa. 2005. Self-propelled prototype soybean harvester. Transactions of the ASAE 48(4):1301-1310.
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- Wang, L., G.M. Ganjyal, D.D. Jones, C.L. Weller and M.A. Hanna. 2005. Modeling of bubble growth dynamics and non-isothermal expansion in starch-based foams during extrusion. Advances in Polymer Technology 24(1):29-45.
- Xu, Y., Y. Dzenis and M.A. Hanna. 2005. Water solubility, thermal characteristics and biodegradability of extruded starch acetate foams. Industrial Crops and Products 21(3):361-368.
- Xu, Y. and M. Hanna. 2005. Physical, mechanical and morphological characteristics of extruded starch acetate foam. Journal of Polymers and the Environment. 13(3): 221-230.
- Xu, Y. and M.A. Hanna. 2005. Preparation and properties of biodegradable foams form starch acetate and poly(tetremethylene adipate-co-terephthalate). Carbohydrate Polymers 59(4):521-529.
- Xu, Y., K. Kim, M.A. Hanna and D. Nag. 2005. Chitosan-starch composite films preparation and characterization. Industrial Crops and Products 21:185-192.
- Xu, Y., V. Miladinov and M. A. Hanna. 2005. Starch acetate-maleate mixed ester synthesis and characterization. Cereal Chemistry 82(3):336-340.
- Xu, Y., J. Zhou, and M. A. Hanna. 2005. Melt-intercalated starch acetate nanocomposite foams as affected by type of organoclay. Cereal Chemistry 82(1):105-110.
- Zhou, J. and M.A. Hanna. 2005. Effects of the properties of blowing agents on processing and performance of extruded starch acetate. Journal of Applied Polymer Science 97:1880-1890.