



The role of the Royal Swedish Academy of Agriculture and Forestry is, with the support of science and practical experience, to promote agriculture and forestry and related activities, for the benefit of society.

Seminar

The Bioeconomy: A revolution in American Agriculture

Time	Monday 30 January, at 10.00–12.00 (coffee from 09.30)
Venue	Kungl. Skogs- och Lantbruksakademien, Drottninggatan 95 B, Stockholm, Sweden
Registration	No later than 27 of January via this link
Fee	No Fee
Questions	Content: Bo Carlestål, bo.carlestal@ksla.se , tel + 46 8 54 54 77 07, + 46 706 611 471 Registration: Gun Askerö, gun.askero@ksla.se , tel + 46 8 54 54 77 12, +46 701 603 309

A vision of a new Bioeconomy, wherein agriculture replaces petroleum as a source of carbon and energy, is profoundly affecting global agriculture and world economies. Agriculture has been optimized for food and feed, but must now transition to also providing fuels, chemicals and biomaterials. Iowa State University recently established the world's first integrated research and demonstration farm devoted to biomass production and processing that has become a national model for developing advanced biofuels. This research and development approach integrates plant genomics; biomass crop production; new harvesting, storage, transportation methods; and processing of biomass for biofuels and biobased products. Four strategies being developed: advanced technologies for more efficient corn starch and soybean oil conversion; biologically based conversion of cellulosic biomass to ethanol and industrial chemicals; thermally based conversion of cellulosic biomass to a variety of biofuels; and lipid-rich biomass conversion to biodiesel or synthetic diesel (hydrocarbon-based fuel). Today's biofuel industries are based on grains to ethanol and biodiesel, but they will need to transition into tomorrow's bio refineries, hopefully by integrating "bolt-on" technologies. The Bio Century Research Farm also houses the first advanced research bio refinery. Bio refineries will produce a diverse product mix and will alter daily outputs depending on what the marketplace wants to maximize returns just as the petroleum refining industry does. Biological, thermochemical and hybrid conversions are being used to produce value-added intermediates or platform chemicals as well as fuels. Advanced biorefineries may also shift from today's preferred automobile biofuels, ethanol, to better performing and more energy-dense products. Biorefineries will likely need to use a variety of feedstocks to take advantage of the lowest cost inputs depending on location and time of year. Sustainability will be key; it is unacceptable to replace the unsustainable petroleum system with another unsustainable system. Most agricultural researchers agree that U.S. corn production is not sustainable, but integrating biomass crops and new cropping systems may make biofuels production sustainable. This presentation will focus on where we are and where we are going in the Bioeconomy with particular focus on research underway at the BioCentury Research Farm and Iowa State University.

Welcome!

Åke Barklund

General Secretary and Managing Director, KSLA

Programme

The Bioeconomy: A revolution in American Agriculture

Monday 30 January 2012

- 09.30 **Coffee and registration**
- 10.00 **Welcome**
Åke Barklund, General Secretary and Managing Director, KSLA
- 10.05 **The Bioeconomy: A revolution in American Agriculture**
Lawrence A. Johnson, Foreign fellow of the Royal Academy
- 11.00 **Olive oil quality and production**
Rodney Mailer, Australian Oils research, New foreign fellow of the Royal Academy
See attached paper
- 11.20 **Discussion**
- 12.00 **Lunch in Oscars Källare**

Dr. Lawrence A. Johnson

Dr. Johnson earned PhD from the Grain Science & Industry department at Kansas State University. He spent 7 years at the Food Protein R&D Center of Texas A&M University where he led their fats and oils research group. Since 1988 he has been a Professor in the Department of Food Science & Human Nutrition and Director of the Center for Crops Utilization Research at Iowa State University, a center comprised of 50 faculty focused on developing value-added uses for crops. He has provided state and national leadership in adding value to and finding new uses for corn and soybeans. The center has developed many new processing and product technologies to utilize corn, soybeans and alternative crops for food, feed, fuels, industrial chemicals, and biomaterials. He is also Director of the ISU BioCentury Research Farm, which is an integrated research and demonstration facility dedicated to biomass production and processing for biofuels and biobased products. Both facilities work closely with the private sector, have unique research and demonstration pilot plants, and house small business incubators.

His own research program, for which he was awarded 11 patents, has led to new technologies to process soybeans into edible oil and protein products, increase co-product returns in manufacturing fuel ethanol, and improve corn milling. He has published more than 155 peer-reviewed journal articles on corn and soybean utilization. He co-edited the monographs *Corn: Chemistry and Technology* and *Soybeans: Chemistry, Production, Processing and Utilization*, which are the world's most complete references on corn and soybeans. He served 2 years on the Board of Directors for the American Association of Cereal Chemists International and 10 years on the Board of Directors for the American Oil Chemists Society and as president in 2004-2005.



Dr Mailer's role relates to research of oils and oil crops, including quality and crop improvement, applied research significant to the industry and education and training in line with that research. Results from research over many years have been disseminated through scientific journals, advisory articles, industry reports, conferences and workshops, farmers meetings and television, newspaper and radio articles.

Initially Dr Mailer worked to develop canola quality rapeseed, for export markets, to compete in international canola markets. His study focussed on factors responsible for

quality characteristics including agronomic and environmental studies. Many publications on these issues here illustrate the role of nutrients, water and temperature stress on oilseed quality.

For a number of years he has studied olive oil quality and production as the crop has developed into a significant Australian industry. His studies focussed on how quality can be controlled. Irrigation, harvest timing, processing and storage have been the key factors in this research. He has worked to identify issues of fraud or adulteration in commercial olive oils both within Australia and internationally, particularly in the USA. He became accredited with the International Olive Council and utilised those methods to ensure that consumers can ensure what they buy, or sell, is indeed extra virgin olive oil.

Dr Mailer has played a key role in developing standards for edible oils for Australia and globally in his role as a Technical representative on the International Standards Organisation, Codex Alimentarius and Standards Australia.

Dr Mailer developed reliable and rapid methodology which has contributed to developments in the canola industry throughout Australia. He has managed several industry projects with funding provided by Grains Research and Development Corporation, Rural Industries Research and Development Corporation, Horticulture Australia Ltd, Australian Oilseeds Federation, Australian Olive Association and NSW Department of Primary Industries.

For several years he has supervised Australia's major commercial oil testing laboratory, The Australian Oils Research Laboratory, Wagga Wagga, focussing on olive and canola analysis but also encompassing a wide range of oil products.

Dr Mailer continues to play a role in research as a research Fellow with the Department of Primary Industries in NSW within Industry and Investment NSW. He works with industry through the company "Australian Oils Research.

Academic Qualifications

Doctor of Philosophy: University of Manitoba, Winnipeg, Manitoba, Canada, 1993.

Master of Science: Australian National University, Canberra, 1988.

Bachelor of Applied Science: Charles Sturt University, Wagga Wagga, 1982

[Click here](#) for a list of Dr. Mailer's Publications.