Department of Biology
The College of Arts + Sciences | Indiana University Bloomington

Carlos O. Miller Lecture

Thu., Mar. 28, 2018 • 4–5:00 p.m. • Myers Hall 130

Edward S. Buckler, Ph.D.

Research Geneticist with the USDA-Agricultural Research Service, Adjunct Professor of Plant Breeding and Genetics at the Institute for Genomic Diversity, Cornell University

Tackling the global protein and nutrition gaps by specialization of food production

Over the last 25 years, global efforts have made substantial progress in reducing the rate of hunger and malnutrition; however, with the planet's continued population growth, 4.6 billion people will face malnutrition and hunger in the coming decades. At the same time, we have several billion people who are obese and lack access to nutritious affordable fruits and vegetables. Both of these problems stem from inefficiencies built into our production systems that now date back 10,000 years.

A new style of specialization of food production is needed to address the inefficiencies in protein production and improve access to nutritious fruits and vegetables. A three-pronged approach will be presented to address this: (1) Use fermentation to efficiently produce protein for livestock and humans; (2) Reduce protein content and fertilizer inputs for field row crops; and (3) Use controlled environments powered by solar energy to shift efficient photosynthesis to greenhouses co-located with urban populations. A new integration of chemistry, physics, and biology can provide sustainable and healthy routes to feeding our planet through production specialization.

About Dr. Buckler

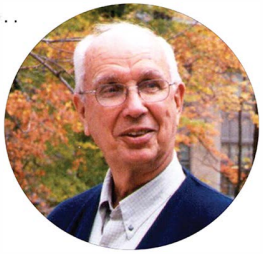
Edward Buckler is among the world's leading experts in the genetics of complex traits.

Buckler pioneered the use of genome-wide association studies in crop plants, an approach that allows chromosomal regions and genes associated with desirable traits to be identified among plant populations that show variability for the traits. Through these efforts, Buckler and his collaborators engaged in a breeding strategy that increased vitamin A content in corn nearly 15-fold, which promises to help prevent blindness resulting from vitamin A deficiency in parts of Africa where subsistence farmers depend on maize as their major source of calories and nutrition. Likewise, Dr. Buckler and his colleagues have carried out breeding strategies that have increased drought and insect resistance for multiple crop plants.

Buckler was elected to the U.S. National Academy of Sciences in 2014. In 2017 he was awarded the National Academy of Sciences Prize in Food and Agriculture Sciences, the inaugural year for this prestigious prize.

In addition to being an expert in genetics, genomics and bioinformatics, Buckler has devoted considerable energy to issues pertaining to sustainable agriculture and ways to feed a human population expected to reach 10 billion within the next 30 years. One usually hears doom and gloom predictions on these topics, but Buckler is an optimist. In his talk, Buckler will present a vision, based on solid scientific principles and evidence, that challenges us to "think outside the box" and change the way we go about food production in order to make the most efficient use of our arable land, dramatically reduce the use of fertilizer, and even eliminate certain familiar crops.

Buckler's message is sure to resonate with our university-wide efforts to identify and tackle grand challenges that face us as a society and as a species. There is no greater challenge than to find ways to feed the planet's burgeoning human population. Buckler has ideas that will capture your imagination and spur debate!



The **Carlos O. Miller Lectures** honor Professor Carlos Miller (1923-2012), a legendary plant hormone pioneer and beloved member of the IU Biology faculty for 55 years. Miller had a longstanding interest in the mechanisms of plant growth and development. Established in 2004, the lecture series brings prominent scientists to Bloomington to discuss their research.

Lecture hosted by Craig Pikaard, HHMI Investigator, Distinguished Professor, and Carlos O. Miller Chair in Plant Growth and Development

Refreshments served prior to lecture