USDA United States Department of Agriculture Office of the Chief Scientist

Visioning of United States, (U.S.) Agricultural Systems for Sustainable Production Stakeholder Listening Session Meeting

Thursday, March 2, 2017 8:30am – 4:30pm USDA South Building Cafeteria

 # 20

George W. Smith
Associate Director
MSU AgBioResearch
Associate Dean for Research
College of Agriculture and Natural Resources
Michigan State University

Oral / no slides

Jimmy Bramblett, Ph.D. (USDA-NRCS) moderating

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 # 21

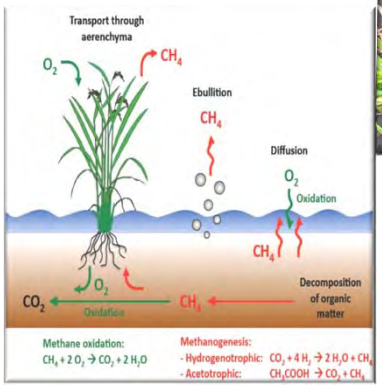
Peter Bachmann

Manager, Government Affairs
USA Rice

SUSTAINABILITY INITIATIVES

Reducing rice's carbon footprint and heavy metals

- Research continuing on alternate wetting/drying (AWD) irrigation methods for rice to reduce methane emissions.
- Research continuing on the correlation of As and Cd in rice using AWD irrigation methods.



The rice methane cycle
Source: Eric C. Brevik

Alternate wetting/drying
Source: IRRI

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Sustainability as a driver for global competitiveness

- Consumers, food companies and retailers are demanding sustainable food production
- Sustainability defined: Greater output per unit of input while minimizing environmental impact and improving society
  - USA rice is unarguably the most sustainable source of rice in the world

Side-inlet precision irrigation using recyclable polyethylene tubing
Source: Delta Farm Press

Sustainable, practical irrigation practices

Crop, Water management	Acre Inches H_2O Applied
Rice, flood-irrigated, contour levee§	36
Rice, flood-irrigated, straight-levee§	34
Rice, flood-irrigated, zero-grade§	22
Rice, zero grade, AWD¥	11

§Massey, 2011 Irrigation trials, Mississippi State University
¥Whitaker Farms, McGehee, Arkansas, 2016

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 # 22

Helen Spafford, Ph.D.

Associate Professor and Chair
Department of Plant and Environmental Protection Sciences
University of Hawaii, Manoa

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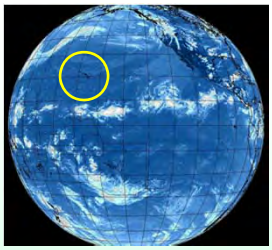
College of Tropical Agriculture and Human Resources
University of Hawai'i at Mānoa

The challenges for sustainable agricultural production in Hawai'i

Helen Spafford, Ph.D.
Associate Professor and Chair,
Department of Plant and Environmental Protection Sciences

Hawai'i



Unique commodities
Diversified agriculture

Food security: ca 90% of food consumed is imported
Energy security: Oil is primary source of energy
Water Security: Rainfall dependence
Invasive pests: Estimates range from 17-20 new insect species introduced every year
Declining human resources in agriculture sector
Declining infrastructure for agricultural development

College of Tropical Agriculture and Human Resources | University of Hawai'i at Mānoa

What's to be done?

Better biosecurity in the US and Hawai'i

Develop novel pest management approaches that decrease reliance on broad-spectrum pesticides

Support local food production including urban agriculture

Change consumer preferences and acceptability in relation to food including what we eat

- e.g. Insects as a viable food source for animals and humans

Change grading standards to reduce food waste

Increase human resources in agriculture sector

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The lessons from Hawai'i

Significant pressures against sustainable food production

- Impacts and pressures from invasive species
- Declining human resources and infrastructure
- Limited local food and energy production

We need to seriously investigate alternative paradigms for food production in Hawaii in relation to:

- Biosecurity and pest management
- Where, how and what is produced and by whom

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 # 23

Max Fisher

National Grain and Feed Association

National Grain and Feed Association

More than 1,000-Member Companies:

- Grain elevators
- Feed, feed ingredient manufacturers
- Oilseed processors
- Flour, corn mills
- Biofuels producers
- Many other related agribusinesses
- 30 State/Regional Associations

- **NGFA activities are focused on providing services and advocating policies that enhance the climate for growth and economic performance of U.S. agriculture participating in a global marketplace**.

National Grain and Feed Association

At Risk for Conversion to Cropland?
U.S. Cropland and Agriculture are under Assault

U.S. Land Use (In Million Acres) 1/

Year	Cropland	CRP Land 2/	Developed	Pastureland	Rangeland	Forest Land	Other Rural Land	Federal Land	Water Areas	Total
1982	420.6	-	71.9	131.3	419.4	410.3	42.8	398.2	49.8	1,944.1
1987	406.4	13.8	77.9	127.4	413.9	412.3	42.9	398.7	50.8	1,944.1
1992	382.0	34.0	85.2	125.8	410.2	412.2	43.2	401.0	50.5	1,944.1
1997	376.4	32.7	95.9	120.7	408.1	413.3	43.5	402.6	51.1	1,944.1
2002	367.7	31.8	104.9	119.3	407.8	413.7	43.4	404.1	51.5	1,944.1
2007	358.9	32.5	111.1	119.7	407.2	413.1	44.9	404.8	51.9	1,944.1
2012	362.7	24.2	114.1	121.1	405.8	413.3	45.4	405.3	52.1	1,944.1

1/ Source: U.S. Department of Agriculture. 2015. Summary Report: 2012 National Resources Inventory, Natural Resources Conservation Service, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa.

2/ CRP land is only CRP general sign-ups and does not include CRP continuous sign-ups.

National Grain and Feed Association

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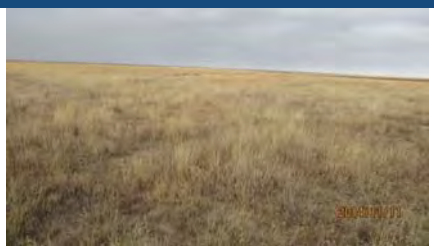
What is Sustainable Agriculture?



This is not Agriculture
Retiring large tracts of cropland is not agriculture. However, a large share of the limited Federal conservation funds are used to prohibit farming and almost completely forbid haying and grazing on retired land.

or

This is Sustainable Agriculture
Research is needed on soil health and its economic benefits to farmers and the rest of the agricultural value chain as well as to communities. This research is needed to help agricultural stakeholders understand the importance of adopting conservation practices and to help Congress design and wisely fund conservation programs that target sustainable agriculture.

National Grain and Feed Association 17

Research Ideas to Help Producers & Policymakers

- Conservation Stewardship Program $1.8 B/yr
  - No-till
  - Cover Crops
  - Conservation Crop Rotation
- Environmental Quality Incentive Program $1.75 B/yr
  - Nutrient Management
  - Filter Strips
  - Anaerobic Digesters

Don't Lose Sight of the Big Picture for U.S. Agriculture

These are the two conservation programs that are capable of assisting farmers sustainably produce on the 362 million acres of cropland and 527 million acres of pastureland and rangeland. Sustainability is critical for the future success of U.S. agriculture.

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 # 24

Jimmy Bramblett

Moderated Questions and Discussion Time

George W. Smith

Peter Bachmann

Helen Spafford

Max Fisher

reminder: if no live comments, go to WebEx chat

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 # 25

Juli Obudzinski

National Sustainable Agriculture Coalition (NSAC)

Oral / no slides

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 # 26

Mitch Hunter

PhD Candidate in Agronomy
NSF Graduate Research Fellow
Plant Science Department
Penn State University

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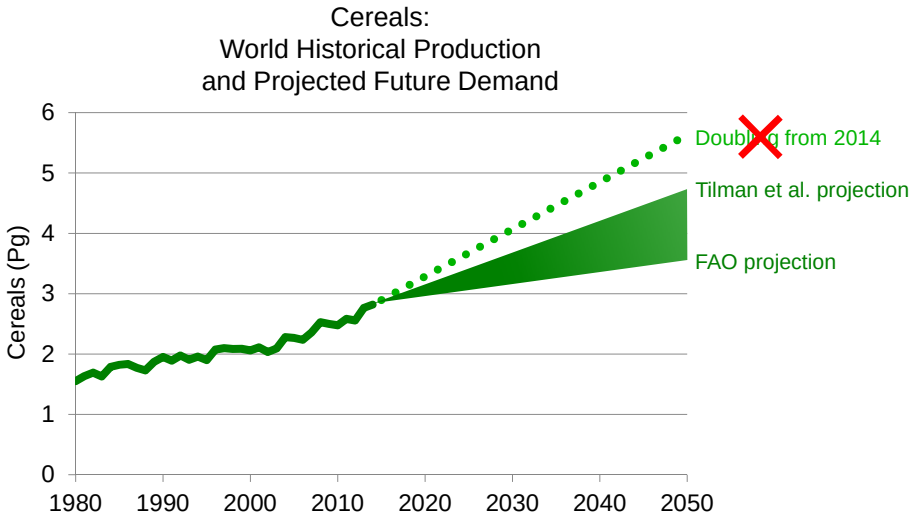
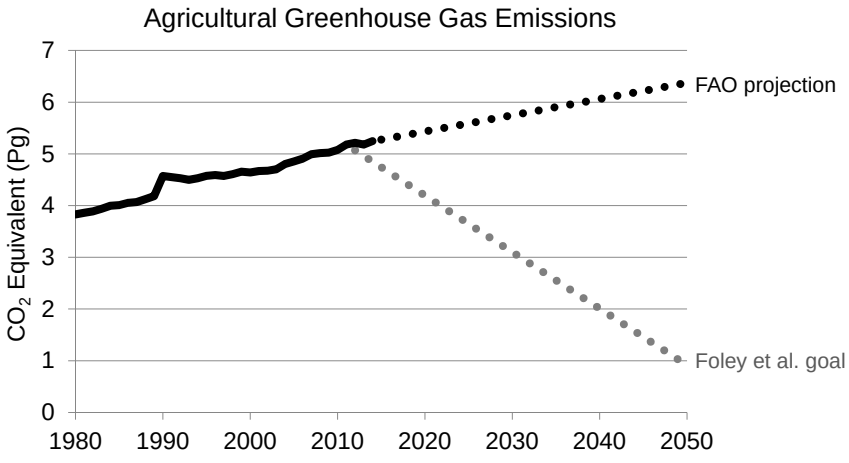
Updated Projections of Food Demand



Tilman et al. 2011. PNAS 108.
Alexandratos and Bruinsma 2012. FAO.
FAOSTAT 2016.

GHG Emissions

80% reduction goal



Foley et al. 2011. Nature 478.
FAOSTAT 2016.

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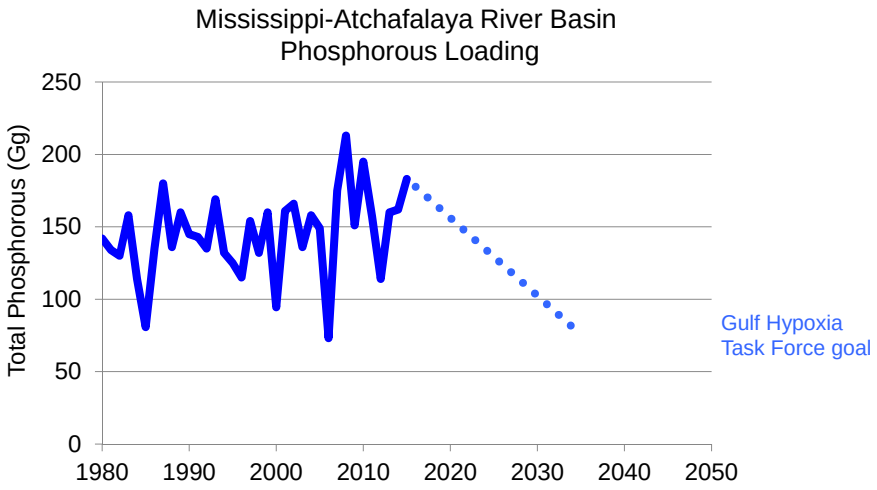
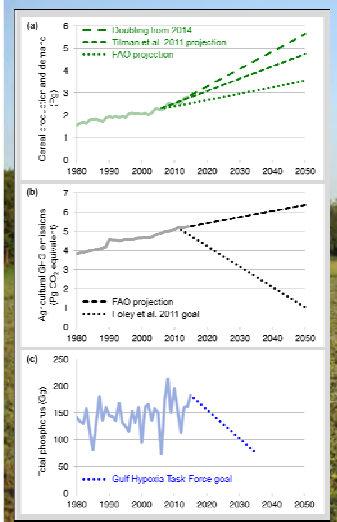
Mississippi River Nitrogen & Phosphorous

45% reduction from 1980-96 avg.



Gulf Hypoxia Task Force 2015.
USGS 2016. Annual Nutrient Flux and Concurrent Streamflow.

The path to 2050



- Research priorities
  - ID production and (especially) environmental goals
  - Develop agricultural systems that can meet both goals
- Need to change the narrative
  - Don't call for doubling food production on a global level
  - Aim at specific food security and environmental outcomes

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 # 27

Marcia S. DeLonge, Ph.D.

Scientist, Food & Environment Program
Union of Concerned Scientists

Investing in Agroecology

Credits: PR Westerman, L Schulte Moore, T Carter, Savanna Institute

Union of Concerned Scientists

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Credit: PR Westerman


Credit: L Schulte Moore

The Case for More Public Investment in Agroecology Research

Contents lists available at ScienceDirect

Environmental Science & Policy

journal homepage: www.elsevier.com/locate/envsci

Investing in the transition to sustainable agriculture

Marcia S. DeLonge[a,*], Albie Miles[b], Liz Carlisle[c]

Scientist and Expert Statement of Support For Public Investment in Agroecological Research

We support greater public investment in agricultural research that applies ecological principles and relies, to the greatest extent possible, on ecological processes ("agroecology") to address current and future farming challenges.

Agroecology regards farms as ecosystems embedded in broader landscapes and society. Agroecological approaches are based on understanding and managing ecological processes and biological functions to increase and sustain crop and livestock productivity, efficiently recycle inputs, and build soil fertility, while minimizing harmful impacts on soil, air, water, wildlife, and human health.[1-5] Hallmarks of agroecological farming practices include increasing the types of crops rotated on fields from year to year; controlling pests and weeds with fewer chemical pesticides; enhancing soil health while reducing the need for synthetic fertilizers; and valuing non-cropped areas of farms for the services they provide.

<1% of funds included agroecology

> 400 PhD signers

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 # 28

Montague (Tag) Demment

Vice President International Programs
Association of Public & Land-grant Universities

Professor Emeritus
University of California, Davis

Association of Public & Land-Grant Universities

The Challenge of Change:
Harnessing University Engagement, Learning, and Discovery to Achieve Food and Nutrition Security

Why Universities?

Universities are uniquely equipped, by virtue of their broad-ranging subject matter expertise and global experience, to respond to the multi-dimensional issues that impact global food security.

At public and land-grant universities all relevant disciplines are present and can come together to address these complex issues.

Systemic change, new funding patterns, innovations in public policy and governance, and unprecedented global partnerships are needed.

ASSOCIATION OF PUBLIC & LAND-GRANT UNIVERSITIES

Commission Objectives

Identify the key challenges critical to achieve domestic and global food and nutrition security

Determine how universities, working with key partners, can mobilize their resources to more effectively address the challenges

Recommend actions that will enhance and align private and public sector resources to foster innovative solutions to the identified challenges

ASSOCIATION OF PUBLIC & LAND-GRANT UNIVERSITIES

Grand Challenges

AVAILABILITY

Increase yields, profitability, and environmental sustainability simultaneously
Develop the varieties and breeds needed for sustainable food systems
Decrease food loss and waste through more efficient distribution systems

ACCESS

Create and share resources that serve food insecure populations
Ensure inclusive food systems

UTILIZATION

Eliminate the dual burdens of undernutrition and obesity
Ensure a safe and secure food supply

Association of Public & Land-grant Universities

Report Release

University Food Security Summit – May 16, 2017 in Washington, DC

Hill Briefing – May 17, 2017 in Washington, DC

Association of Public & Land-grant Universities

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 # 29 **Jimmy Bramblett, Ph.D. (USDA-NRCS)**

Moderated Questions and Discussion Time

Juli Obudzinski

Mitch Hunter

Marcia S. DeLonge

Montague Demment

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 # 30 **20min Break and Networking**

reminder: stop and restart WebEx Recording to reduce file size