



# *Alfalfa/Corn Rotations* *for sustainable Cellulosic Biofuels Production*

## *Alfalfa/Corn Rotations...* A Sustainable System to Produce Food, Feed, & Bioenergy

*June 29-30, 2010*

*Pioneer Hi-Bred Carver Center  
Johnston, Iowa*



WORKSHOP ORGANIZERS:




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[www.ncga.com](http://www.ncga.com)

[www.alfalfa.org/10workshop.php](http://www.alfalfa.org/10workshop.php)



*The Alfalfa/Corn Rotations Workshop* will offer a close look at the benefits of an alfalfa/corn production system as it relates to cellulosic ethanol. This system can offer a sustainable approach to help the nation reduce its dependence on foreign oil sources. The tremendous production capacity of the Corn Belt must be harnessed if we are to meet our national goals for bioenergy production, without compromising traditional food/feed supplies.

An alfalfa/corn rotation offers unique benefits as a dedicated lignocellulosic production system:

- Alfalfa is a perennial legume crop widely grown throughout the U.S. Corn Belt
- Alfalfa does not require nitrogen fertilizer
- Corn supplemental nitrogen is reduced by 75% over 2 years in an alfalfa/corn rotation
- Corn yields are increased by 5-15% following alfalfa
- Alfalfa can provide high yields of feed protein
- Alfalfa/corn rotations reduce nitrate concentrations in soil and drainage water
- Alfalfa prevents erosion
- Alfalfa leaves and stems can be separated, using the leaves as a high protein feed source and the stems as biomass for cellulosic ethanol production

The goal of the workshop is to bring together leading forage and corn agronomists, ethanol producers, and industry representatives in the Corn Belt to develop an action plan to reap the environmental and economic benefits of an alfalfa/corn rotation system.

## MEETING VENUE & LODGING

***The Alfalfa/Corn Rotations Workshop will be held in Johnston, IA - in the heart of the Corn Belt.***



### **Pioneer Hi-Bred Carver Center**

7200 NW 62nd Ave  
Johnston, Iowa 50131  
800.247.6803

### **Hilton Garden Inn Des Moines/Urbandale**

8600 Northpark Drive  
Johnston, IA 50131  
515.270.8890  
Pioneer rate – \$67

### **Sheraton West Des Moines**

1800 50th Street  
West Des Moines, IA 50266  
515.223.1800  
Pioneer rate - \$84/night - includes hot breakfast buffet  
(Shuttle not available to Pioneer Center from this hotel)

### **TownePlace Suites**

8800 Northpark Drive  
Johnston, IA 50131  
515.727.4066  
Pioneer rate – \$64 for King studio/\$87 for One Bedroom Suite

When making your reservation,  
request the ***Pioneer Event Group Rate.***



## Agenda Overview

### TUESDAY, JUNE 29

- 12:45 p.m.** Welcome - Tom Buis, Growth Energy
- 1:15 p.m.** Alfalfa: A Companion Crop with Corn - Hans Jung, USDA-ARS, St. Paul
- 1:45 p.m.** Alfalfa Management & Yield - Craig Sheaffer, University of Minnesota
- 2:15 p.m.** Harvest, Storage, & Fractionating Alfalfa - Kevin Shinnors, University of Wisconsin-Madison
- 2:45 p.m.** Economics of Alfalfa/Corn Systems - Dan Undersander, University of Wisconsin-Madison
- 3:15 p.m.** **Break**
- 3:30 p.m.** Ethanol from Alfalfa - Bruce Dien, USDA-ARS, Peoria
- 4:00 p.m.** Compatibility with Corn: N Credits - Michael Russelle, USDA-ARS, St. Paul
- 4:30 p.m.** Soil Carbon - John Baker, USDA-ARS, St. Paul
- 5:00 p.m.** Cellulosic Ethanol Economics & Carbon Footprint - John Miranowski, Iowa State University
- 5:30 p.m.** Ethanol Producer/Enzyme Panel
- Charles Abbas, ADM
  - Bob Randle, Genencor, A Danisco Division
  - Thomas Robb, Abengoa Bioenergy Corporation
  - Owen Shunkwiler, POET
- 6:00 p.m.** Roundtables & Working Dinner
- Breakout Groups:**
- Agronomic Issues** (soils, tillage, seeding, fertilizer, pesticides, harvesting)
  - Environmental Issues** (carbon, nitrogen, erosion, land use)
  - Logistical Issues** (machinery, supply timelines, fractionation)
  - Conversion Issues** (composition, variability, limits to conversion)
  - Economic & Policy Issues** (costs, income streams, subsidies)

### WEDNESDAY, JUNE 30

- 8:00 a.m.** Opening Remarks
- 8:15 a.m.** Corn Yield Boost - Joe Lauer, University of Wisconsin
- 8:45 a.m.** Roundtable Reports
- 10:00 a.m.** **Break**
- 10:15 a.m.** Identify a Steering Committee & Develop an Action Plan

# Alfalfa/Corn Rotations for Sustainable Cellulosic Biofuels Production

**National Alfalfa & Forage Alliance** is an alfalfa and forage industry trade association headquartered in St. Paul, Minnesota. Its mission is to ensure the ability of all segments of the alfalfa and forage industry to compete effectively and profitably, domestically and abroad. NAFA is an alliance of state and regional affiliate organizations, industry, and university/research partners.

**National Corn Growers Association** is a producer directed trade association headquartered in St. Louis, Missouri. Its mission is to create and increase opportunities for corn growers. NCGA is a federation of state organizations, corn boards, councils and commissions that develops and implements policies and programs on a state and national level to help protect and advance the corn producer's interests.

**TUESDAY, JUNE 29**

**12:45 p.m. Welcome**

**Beth Nelson, National Alfalfa & Forage Alliance (NAFA)**

**Rick Tolman, National Corn Growers Association (NCGA)**

**Tom Buis (Moderator), Growth Energy**



Beth Nelson  
NAFA President



Rick Tolman  
NCGA CEO



Tom Buis is a former President of the American National Farmers Union (NFU) and is current CEO of Growth Energy. Before moving to NFU Buis served as the Senior Agriculture Policy Advisor for Senate Majority Leader Tom Daschle. Growth Energy is committed to the promise of agriculture and growing America's economy through cleaner, greener energy. Growth Energy members recognize America needs a new ethanol approach. Through smart policy reform and a proactive grassroots campaign, Growth Energy promotes reducing greenhouse gas emissions, expanding the use of ethanol in gasoline, decreasing our dependence on foreign oil, and creating American jobs at home.

**1:15 p.m. Alfalfa: A Companion Crop with Corn, Hans Jung, USDA-ARS, St. Paul**



Hans Jung received his Ph.D. in Animal Science from the University of Illinois. He spent four years as a Research Animal Scientist at the USDA-ARS U.S. Meat Animal Research Center in Nebraska working on forage utilization and grazing by cattle and sheep. He joined the USDA-ARS Plant Science Research Unit in St. Paul, MN, in 1986 as a Research Dairy Scientist and also as a cluster scientist of the U.S. Dairy Forage Research Center in Madison, WI. Jung's research career has focused on how plant cell wall chemistry limits forage digestibility and, since 1993, has spent increasing amounts of time on biomass energy research.

**1:45 p.m. Alfalfa Management & Yield, Craig Sheaffer, University of Minnesota**



Craig Sheaffer, Professor in the Department of Agronomy and Plant Genetics at the University of Minnesota works with: research and education; alfalfa and forage management; sustainable cropping systems; and is the director of the sustainable agriculture graduate program. Dr. Sheaffer has extensive experience developing and managing forage crops, grasses and native perennials, and works closely with an interdisciplinary group of faculty, students, and non-profit organizations in exploring alternative crops for more sustainable agricultural systems.

**2:15 p.m. Harvest, Storage, & Fractionating Alfalfa, Kevin Shinnars, University of Wisconsin-Madison**



Kevin Shinnars is currently a full-professor in the Department of Biological Systems Engineering at the University of Wisconsin-Madison. His current research efforts concentrate on developing more efficient means of harvesting, processing, handling, storing and transporting biomass feedstocks; improving machines and systems for harvesting high-quality hay and forage; and sensors and systems for precision farming as it applies to hay, forage, and biomass production. He currently serves as Vice-Chair for the Department of Biological Systems Engineering.

## *Alfalfa/Corn Rotations for Sustainable Cellulosic Biofuels Production*

**2:45 p.m. Economics of Alfalfa/Corn Systems, Dan Undersander, University of Wisconsin-Madison**



Dr. Undersander received his PhD degree from Purdue University. He is the University of Wisconsin extension/research forage agronomist and he coordinates the multi-department Extension forage team. He conducts the largest forage variety trials in the U.S. He conducts research on grazing, forage production and utilization, and near infrared reflectance (NIR) prediction of forage quality and other parameters. Dan has worked with farmers across North and South America and Eastern Europe. He is involved with several regional and national organizations and activities. He has published over 1,000 articles. He is a fellow in both the American Society of Agronomy and Crop Science Society of America.

**3:15 p.m. Break**

**3:30 p.m. Ethanol from Alfalfa, Bruce Dien, USDA-ARS, Peoria**



Dr. Dien received a PhD in Biochemical Engineering from the University of Minnesota. He is a lead scientist for one of the units researching biofuels at the National Center of Agricultural Research. His research is focused on conversion of bioenergy crops, including alfalfa, into biofuels. He is currently working with ARS plant production researchers to develop integrated processes for conversion of lignocellulosic biomass into sugars and bioethanol. He has previously worked on processing corn and corn fiber products into ethanol as well as microorganism development for fermentation of sugar mixtures into bioethanol.

**4:00 p.m. Compatibility with Corn: N Credits, Michael Russelle, USDA-ARS, St. Paul**



Since receiving a PhD from the University of Nebraska, Michael Russelle has been a Research Soil Scientist with the USDA-ARS, St. Paul. He is also affiliated with the U.S. Dairy Forage Research Center in Madison, WI, and is an Adjunct Professor in the Department of Soil, Water, and Climate, at the University of Minnesota. His research has focused on improving nutrient cycling in mixed livestock-cropping systems to improve profitability and reduce off-site contamination. Alfalfa, corn, and grass forages have been the principal crops in his research. He has identified value-added functions for perennial forages in cropping systems, including the use of alfalfa and grass forages to remove excess nitrate from soil and water.

**4:30 p.m. Soil Carbon, John Baker, USDA-ARS, St. Paul**



John Baker is the Research Leader for the USDA-ARS Soil & Water Management Unit in St. Paul, Minnesota, and an Adjunct Professor in the Department of Soil, Water & Climate at the University of Minnesota. His educational background is in soil physics and micrometeorology, and in recent years his research has been focused on the exchange of trace gases and the cycling of carbon in agricultural systems. This has included traditional corn-soybean rotations, as well as alternative systems with winter cover crops and permanent living mulches.

**5:00 p.m. Cellulosic Ethanol Economics & Carbon Footprint, John Miranowski, Iowa State University**



John Miranowski is Professor of Economics at Iowa State University in Ames, Iowa. He received his B.S. from Iowa State University, and received both his M.A. and PhD from Harvard University in economics. He teaches and publishes on natural resource and environmental economics (including biofuel economics, policy, and rural development). He has also served as USDA's Economic Research Service division director where he led a \$12 million policy research and analysis program in environmental, resource, and technology economics. He received the USDA Distinguished Service Award for Biofuel Program Development.

# Alfalfa/Corn Rotations for Sustainable Cellulosic Biofuels Production

## 5:30 p.m. Ethanol Producer/Enzyme Panel

**Charles Abbas, ADM**

**Bob Randle, Genencor, A Danisco Division**

**Thomas Robb, Abengoa Bioenergy Corporation**

**Owen Shunkwiler, POET**



Charles Abbas is ADM's Director of Yeast and Renewable Research. His areas include bioprocessing of commodity crops and their residues to produce high value-added products; development of yeast strains for industrial fermentations; and large-scale fermentation production of ethanol, polymers, amino acids, enzymes, vitamins, carotenoids and organic acids using bacterial, fungal, and algal systems. He received the Alltech Medal of Excellence for Alcohol Production in 2001. He received his PhD in Microbiology & Cell Science with Biochemistry as a supporting area from the U of Florida.



Bob Randle serves in the role of Commercial Development, Fuel Ethanol for Genencor, a Danisco Division. He works with existing and proposed ethanol plants throughout the U.S. Most of the ethanol plant development work is using corn as the feedstock, but Bob also has innovative projects using other cereal grains, combined feedstocks and non-traditional feedstocks. Coming from the corn wet milling industry, Bob has a keen interest in projects using fractionated feedstocks, creating higher value co-products. Bob received his M.S. in Environmental and Civil Engineering at the University of Illinois-Champaign.



Thomas Robb is manager of Institutional Relations for Abengoa Bioenergy Corporation. From 1981-1984, he was an Asst Professor with NCSU stationed in Brazil as a collaborative research program leader. In 1985, he joined IMC Corp in its animal health division as International Technical Service Manager. He became Research and Development Project Manager and then Business Unit Manager for all North American cow/calf products. He joined Ivy Animal Health in 1999 leading business development and acquisitions. In 2000, he joined ImmTech to lead bovine sales, marketing, and technical services. He joined Abengoa in 2004. He received his PhD from the University of Kentucky in ruminant nutrition.



Owen Shunkwiler has been General Manager of POET Biorefining – Coon Rapids, Iowa since its startup in 2002. In 2005, he oversaw installation of new technology including POET's patented BPX (which eliminates "cooking" from the process) and BFrac (fractionation). He promotes jobs at home in Iowa and decreasing our dependence on foreign oil through greater ethanol use. He represents the plant on the board of Iowa Renewable Fuels Association, Iowa Ethanol Producers Association, and Growth Energy.

## 6:00 p.m. Roundtables & Working Dinner

**Agronomic Issues • Environmental Issues • Logistical Issues • Conversion Issues • Economic & Policy Issues**

## WEDNESDAY, JUNE 30

### 8:00 a.m. Opening Remarks

### 8:15 a.m. Corn Yield Boost, Joe Lauer, University of Wisconsin



Dr. Lauer received his Ph.D. in Agronomy from the University of Minnesota. He is currently a professor of agronomy and state extension agronomist focusing on developing relevant corn management programs that address needs expressed by Wisconsin farmers. Specific objectives focus on management decision-making regarding crop productivity, quality, and production system efficiency including hybrid selection, rotation, tillage, and replant and yield loss damage assessments. His emphasis is on impacts of cropping practices on grower profitability, the environment, and natural resource conservation.

### 8:45 a.m. Roundtable Reports

### 10:00 a.m. Break

### 10:15 a.m. Identify a Steering Committee & Develop an Action Plan



## Participant Registration

### WAYS TO REGISTER (Free if registered by June 14th)

#### ONLINE-

Go to [www.alfalfa.org/bioenergy.html](http://www.alfalfa.org/bioenergy.html) and click on Registration.

#### FAX-

completed registration form to 651.638.0756.

#### MAIL-

completed registration form to:  
NAFA  
Attn: Alfalfa/Corn Workshop  
4630 Churchill Street #1  
St. Paul, MN 55126

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Preferred Name to Use on Name Tag: \_\_\_\_\_

Title/Position: \_\_\_\_\_

Company/Agency/University/Farm: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip/Postal Code: \_\_\_\_\_

Country: \_\_\_\_\_

Daytime Telephone Number: \_\_\_\_\_

Email: \_\_\_\_\_

Website: \_\_\_\_\_

### Registration Fees

The registration fee for this workshop is waived if preregistration is received **by Monday, June 14th**. On-site registration or registrations received after June 14th will be \$100 per participant.

### Roundtable Sessions

Please select your **first two choices** of concurrent breakout sessions (1st, 2nd):

- Agonomic Issues** (soils, tillage, seeding, fertilizer, pesticides, harvesting)
- Environmental Issues** (carbon, nitrogen, erosion, land use)
- Logistical Issues** (machinery, supply timelines, fractionation)
- Conversion Issues** (composition, variability, limits to conversion)
- Economic & Policy Issues** (costs, income streams, subsidies)
- No Preference on session**

### Cancellation Policy

Registrants unable to attend are encouraged to send a substitute at no additional charge. Please call ahead so information can be changed prior to participant's arrival.



## Thanks sponsors!



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