EPA United States Environmental Protection Agency

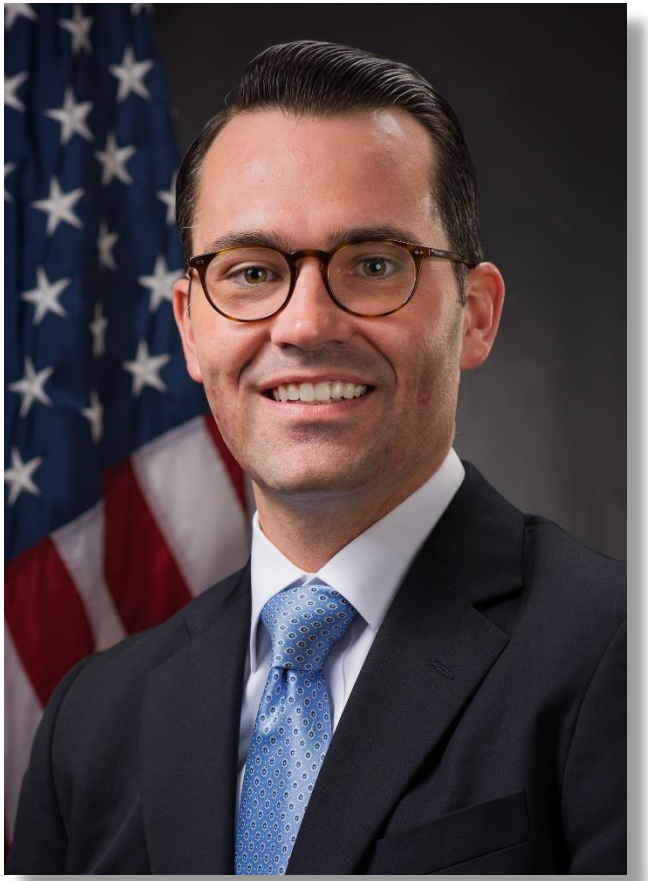
USDA

Next Gen Fertilizer Challenges

NEXT GEN FERTILIZER CHALLENGES

Scott Hutchins
Deputy Under Secretary

United States Department of Agriculture's Research, Education, and Economics Mission Area



Owen McDonough
Senior Science Advisor to the Assistant Administrator

Unites States Environmental Protection Agency
Office of Water

Next Gen Fertilizer Challenges

- **Outline:**
  - **Brief introduction**
  - **Perspectives from collaborating organizations**
  - **Summary of Challenge Details**
  - **Questions**

Next Gen Fertilizer Challenges

- **Goal:** To accelerate the development and use of existing and new technologies for corn production that maintain or increase crop yields affordably and reduce environmental impacts to air, land, and water.
- **Structure:** Partnership between EPA and USDA, in collaboration with The Fertilizer Institute (TFI), the International Fertilizer Development Center (IFDC), The Nature Conservancy (TNC), and the National Corn Growers Association (NCGA).

EPA USDA THE FERTILIZER INSTITUTE IFDC Developing Agriculture from the Ground Up

The Nature Conservancy NATIONAL CORN GROWERS ASSOCIATION

THE FERTILIZER INSTITUTE

Motivation and Background

NEXT GEN FERTILIZER CHALLENGES

- Represents the U.S. fertilizer industry by addressing public policy, communication, stewardship and market intelligence needs of fertilizer producers, wholesalers, and retailers.
- Fertilizers are essential to replenishing soil nutrients used by plants each growing season, but incorrect nutrient use leads to negative impacts on a grower's Return On Investment (ROI) and the environment.
- TFI members advance development and use of technologies and scientifically based management for cropping systems to meet sustainability goals.
- Beyond environmental and agronomic benefits, the Challenges stimulate greater innovation and greater attention on the value of Enhanced Efficiency Fertilizers (EEFs) and other product technologies.

Motivation and Background

- IFDC is a public international organization with the mission to bring together innovative research, market expertise, and strategic public and private sector partners to identify and scale sustainable solutions for soil and plant nutrition that benefit farmers, entrepreneurs, and the environment.
- Improving use efficiency of fertilizers and reducing impact on environment is deeply entrenched in *IFDC's vision of healthier soils and plants for a food-secure and environmentally sustainable world.*
- Emphasize the need for renewed interest in fertilizer research, innovative products, and analytical procedures.
- Demonstrate that environmental protection, food and nutrition security, and farm profitability can be achieved without compromises or tradeoffs, creating a win-win for all.
- Share the lessons we learn with the rest of the world.

Motivation and Background

- TNC is a global conservation nonprofit working to create a world where people and nature thrive. Learn more about our work with the food and agriculture industries to achieve a regenerative food system at nature.org/workinglands.
- Innovation is at the core of agriculture. Fertilizer is essential to a profitable and productive farming operation, and we believe there is great value in exploring innovations in the production and the efficient management of fertilizer.
- We are excited to be part of a challenge that is designed to inspire innovative ideas into action. We look forward to hearing from the next generation of innovators destined to help our nation's farmers feed a growing population, while also protecting our lands, waters and air.

Motivation and Background

- The National Corn Growers Association (NCGA) represents nearly 40,000 dues-paying corn farmers nationwide and 300,000 growers who contribute through corn checkoff programs in their states.
- Working with our 50 affiliated state organizations we aim to create and increase opportunities for corn growers and to sustainably feed and fuel a growing world.
- One of the key priorities for NCGA is to promote sustainable farming practices that build up soil health, allowing farmers to improve productivity and profitability while also preserving natural resources for future generations.
- We hope to see increased adoption of technologies that will reduce the environmental impacts of corn production and improve our growers' profitability.

Two Challenges

1. **EEFs: Environmental and Agronomic Challenge ("EEFs Challenge")**

2. **Next Gen Fertilizer Innovations Challenge ("Next Gen Challenge")**

EEFs Challenge Overview

Goal: Identify existing EEFs that meet or exceed environmental and agro-economic criteria

Scope: EEFs already on- or near-market

Process:

- Stage 1:
  - Solvers submit information describing EEF and how it meets the requirements
  - Submissions reviewed by expert judging panel
  - Winners receive recognition and potentially advance to Stage 2
- Stage 2:
  - Subset of solutions participate in greenhouse testing
- Stage 3:
  - Plans for field trials

Proposal Requirements: EEFs Challenge

- Submissions must be in PDF format (max 10 pages w/o references)
- Submissions must include:
  - Executive Summary
  - Detailed Description
  - Environmental Performance
  - Agronomic Performance
  - Compatibility with Existing Farming Machinery and Practices
  - Confidential Business Information (CBI) Statements

Technical Requirements: EEFs Challenge

- Must **improve environmental performance** by reducing nutrient losses to the environment through any combination of
  - Reduced NH_3 volatilization
  - Reduced N_2O emission
  - Reduced N/P runoff or leaching
- Must **improve agronomic performance** by
  - Not reducing yield
  - Not increasing net farm costs in terms of return on investment (ROI)
- Larger improvements will receive higher ratings
- Must be applicable to corn in the United States
- Must be an EEF on the market or near-market
- Must be compatible with current farming machinery

Judging Criteria: EEFs Challenge

- Challenges will be judged by a panel of experts from a range of institutions, demographics, and technical expertise.
- Scoring (100 points total):
  - Environmental performance (35 points):
  - Agronomic performance (35 points):
  - Other performance criteria (20 points):
  - Expert discretion points (10 points)

Timeline: EEFs Challenge

- **10/30/2020**: EEFs: Environmental and Agronomic Challenge closes
- Winter 2020/2021: Winners announced (dates TBD)
- Winter/Spring 2021: Greenhouse trials begin
- Summer/Fall 2021: Stage 2 winners announced (greenhouse)
- Fall/Winter 2021: Showcasing event
- Spring 2022: Field trials begin*

** Pending administration priorities and available resources*

Awards and Prizes: EEFs Challenge

- Recognition from EPA, USDA, and Collaborators
- Possible advancement to greenhouse trials for Stage 2
- Invitation to showcasing event in Fall/Winter 2021

Participate & Learn More

- **EEFs: Environmental and Agronomic Challenge**
  - Participate: Email proposals to: Submission_NextGenFertilizerChallenges@epa.gov
  - Learn more: https://www.challenge.gov/challenge/eefs-environmental-agronomic-challenge/

Next Gen Challenge Overview

Goal: identify next generation concepts for novel technologies

Scope: EEFs not near market or other novel technologies for fertilizers and product technology innovations

Process:

- Expert judging panel will review submissions and recommend winners
- $65,000 prize pool and invitation to showcasing event

Solvers are not required to give up any of their intellectual property ("IP") rights to be eligible to receive an award

Solvers make clear statements on any Confidential Business Information (CBI) to be withheld from the submission, or included in the submission but withheld from either judging panel or the public

Proposal Requirements: Next Gen Challenge

- Submissions must be in PDF format (max 10 pages w/o references)
- Submissions must include the following:
  - Executive Summary
  - Detailed Description
  - Environmental Performance
  - Agronomic Performance
  - Compatibility with Existing Farming Machinery and Practices
  - Confidential Business Information (CBI)
  - *Trajectory to Market**

* *Next Gen Fertilizer Innovations Challenge only*

Technical Requirements: Next Gen Challenge

- Must **improve environmental performance** by reducing nutrient losses to the environment through any combination of
  - Reduced NH_3 volatilization
  - Reduced N_2O emission
  - Reduced N/P runoff or leaching
- Must **improve agronomic performance** by
  - Not reducing yield
  - Not increasing net farm costs in terms of return on investment (ROI)
- Larger improvements will receive higher ratings
- Must be applicable to corn in the United States;
- Must not be an EEF already on market or near-market;
- Must ultimately be compatible with current agricultural machinery and practices used for common large-scale production such as planters, fertilizer applicators or tillage equipment.

Judging Criteria: Next Gen Challenge

- Challenges will be judged by a panel of experts from a range of institutions, demographics, and technical expertise.
- Scoring (100 points total):
  - Environmental performance (35 points):
  - Agronomic performance (35 points):
  - Other performance criteria (20 points):
  - Expert discretion points (10 points)

Timeline:
Next Gen Challenge

- **11/30/2020**: Next Gen Fertilizer Innovations Challenge closes
- Winter 2020/2021: Winners announced
- Fall/Winter 2021: Showcasing event

Awards and Prizes: Next Gen Challenge

- Cash awards: Minimum of $10,000 from a prize purse of $65,000
- Non-cash awards:
  - Recognition from EPA, USDA, and Collaborators
  - Invitation to showcasing event in Fall/Winter 2021

Participate & Learn More

- **Next Gen Fertilizer Innovations Challenge**
  - Participate: Register with InnoCentive and submit here:
  - https://innocentive.wazoku.com/#/challenge/4380f517f84f49b78ad3dab8b4657e6e
  - Learn more: https://www.challenge.gov/challenge/next-gen-fertilizer-innovations-challenge/

Questions?

General

Email to: Question_NextGenFertilizerChallenges@epa.gov

EEFs: Environmental and Agronomic Challenge

Email to: Question_NextGenFertilizerChallenges@epa.gov

Next Gen Fertilizer Innovations Challenge

Login at InnoCentive, register, and submit here: https://innocentive.wazoku.com/#/challenge/4380f517f84f49b78ad3dab8b4657e6e