

Please provide a 1-3 sentence description of your organization.

**Pioneer Hi-Bred, a DuPont business**, is the world's leading source of customized solutions for farmers, livestock producers and grain and oilseed processors. With headquarters in Des Moines, Iowa, Pioneer provides access to advanced plant genetics in nearly 70 countries. DuPont is a science-based products and services company. Founded in 1802, DuPont puts science to work by creating sustainable solutions essential to a better, safer, healthier life for people everywhere. Operating in more than 70 countries, DuPont offers a wide range of innovative products and services for markets including agriculture and food; building and construction; communications; and transportation.

Relative to bioenergy, what are your top problems and what research products (or what researchable questions to which you need answers) would help you solve these problems?

- Produce improved plant genotypes that enable sustainable production of high volume, high value raw materials for biofuels production.
- Environmental sustainability of bioenergy – life cycle analysis of biofuels production processes focusing on recent advances in two areas. First, starch-based biofuels production where numerous advances have been made including: improved enzymes (e.g. enzymes that enable granular starch hydrolysis), improved processes (e.g. increased energy efficiency, corn grain fractionation, granular starch hydrolysis), and plant genetics (e.g. increased harvestable yields, insect and disease resistance, drought tolerance, Nitrogen use, increased substrate concentration). Second, biofuels production by enzymatic hydrolysis and fermentation of non-starch plant biomass. Several technology demonstration projects supported by DOE will come online in the next several months. Each will raise different, new questions around environmental sustainability.
- Integrating economic systems of bioenergy production – the value chain that starts with plant genetics and ends with biofuels distribution is changing. A system traditionally focused on flexibility for crop producers, other raw material providers (e.g. paper waste), and processors is becoming more interested in building relationships between crop producer and raw material (grain, biomass) buyer. How will value be captured/shared along this potentially more committed value chain?
- Ongoing engineering and life cycle evaluation of bioenergy production processes – developing bioenergy crops and trait targets within bioenergy crops is made more difficult because candidate bioenergy production processes are so different (physical-chemical to biological). Lead times in bioenergy crop development are long so early identification of broadly applicable plant traits is desirable.

What do you think ARS' top bioenergy research priorities should be (no more than five, please)?

- Continue to support basic and applied research in plant biology.
- Analyze the environmental sustainability of current and future bioenergy production systems.

- Investigate possible future states of economic systems developing around bioenergy crop and other raw material production systems.

**Additional customer service questions:**

*What might ARS do to serve its customers/stakeholders better?*

- Active participation in scientific meetings at the regional, national, and international levels.
- Active participation in basic and applied research projects with academic and industrial partners.
- Attract and retain talented scientists and managers.

*What, in particular, about ARS would lead you to recommend ARS to someone else looking for similar research products?*

Expertise of individual USDA investigators and success (meaningful contributions to scientific progress) of USDA programs through time.