



The 2nd Annual Soybean Research Forum and Think Tank was held in Indianapolis, Indiana on July 12-14, 2022. Representatives from 14 QSSBs, three regional checkoff organizations, the United Soybean Board, 10 land grant universities, 9 larger and small companies, and one federal agency all participated. The theme of the 2022 event was ‘Moving from Opportunities to Innovation’ and the key goal was to examine soybean research opportunities and solutions that span the value chain – breaking down some of the traditional bins and silos between “production research” and “new uses research”.

Four areas that addressed “new” or “emerging” opportunities for soybeans were discussed which included aquaculture, renewable diesel, plant protein, and technology. Participants heard first from experts on the opportunities front, where they got an overview of these emerging markets. And then, from researchers on the innovation front where they got an idea of some of the new and exciting research that is being conducted to meet these opportunities. While these four emerging markets were the focus this year, this by no means we should neglect more traditional markets or limit ourselves to just these areas. These topics were chosen because they represent one segment of the feed, fuel, or food markets for soy and they can serve as “model systems” as to how researchers may can think differently to help drive value in the future.

The primary goal of this meeting was to identify trends, challenges, and opportunities for each of the topics addressed and then move from opportunities to specific strategies that could be explored by the US Soybean Research Collaborative and other groups as opportunities for future research.

This document provides a summary of the information captured from participants at the event. Below are common strategies that surfaced across all four topics discussed and following that are individual topic notes.

Common Strategies

1. Build research teams that include representatives across the value chain to make sure we are delivering for the end users. These teams should include breeders, agronomists, economists, processors, and end-users.
2. Explore possibilities for building infrastructure and logistics to support identify preserve opportunities and traceability within the soybean supply chain.
3. Use data to demonstrate the carbon intensity and sustainability metrics of soybean production.
4. Develop platforms that allow innovators to connect with farmers to bridge the gap between these two parties.
5. Further expand role of commodity groups and Extension programs as unbiased 3rd parties in vetting new technologies.



Aquaculture

Trends	Challenges	Opportunities
<ul style="list-style-type: none"> Emerging markets for aquaculture could generate new demand <ul style="list-style-type: none"> Is soy a more sustainable option than fish meal? Quality is important <ul style="list-style-type: none"> Fatty acids Lower anti-nutritional factors Digestibility Niche/Markets/Premiums <ul style="list-style-type: none"> Need for traceable, consistent supply Seafood is healthy <ul style="list-style-type: none"> Capitalize on this New breeding technologies could be key to new profiles 	<ul style="list-style-type: none"> Competing seed composition components <ul style="list-style-type: none"> Interplay between protein, oil, yield Environmental conditions impact seed traits GM perception issues IP/Traceability/Supply Chain <ul style="list-style-type: none"> Distance from processor Infrastructure for IP Diverse Needs <ul style="list-style-type: none"> Changing ingredients (stable demand?) Vast species diversity with each species requiring a different nutritional “profile” Sustainability <ul style="list-style-type: none"> Need to keep CI score down Certification protocols 	<ul style="list-style-type: none"> IP <ul style="list-style-type: none"> Boutique varieties Premium opportunities Regional specialization Grow Demand <ul style="list-style-type: none"> Soybeans could be ideal choice if research can deliver on “ideal bean” Sustainability <ul style="list-style-type: none"> Ensure SSAP meets aquaculture standards Improve Digestibility Wild Card <ul style="list-style-type: none"> Waste as a fertilizer option Supplement encapsulation technology for nutraceuticals New Use: Soybeans as natural “color/dye” for other food systems Do farmers become fishermen?

Strategies

- Work to ensure there are certification protocols that meet aquaculture requirements
- Increase demand from aquaculture (education among consumers) -> sustainability messaging
 - Understand & combat GMO struggles
 - Compete with fish meal?
- Build infrastructure/logistics to support Identity Preserve (IP) opportunities
 - Regional Opportunities?
 - “Boutique” varieties?
- Integrate teams to include breeders, processors, end-users, and economists to deliver on needs of industry
 - ID traits that will make the most difference
 - Vertical integration?



Renewable Diesel

Trends	Challenges	Opportunities
<ul style="list-style-type: none"> • Sustainability is driving market <ul style="list-style-type: none"> • Consumers are behind this • Regulatory Environment impacts demand <ul style="list-style-type: none"> • Tax incentives • Flex Fuel/smaller engine diesel • Emissions • LCFS • Demand <ul style="list-style-type: none"> • BD, RD, SAF demand increasing • Demand for lower GHG emissions fuels 	<ul style="list-style-type: none"> • Food vs Fuel Arguments <ul style="list-style-type: none"> • Which takes priority • Perception or reality • Can we meet demand for both • IP/Traceability/Supply Chain <ul style="list-style-type: none"> • Payment/value to farmer? • Infrastructure for IP • Processing equipment required is \$\$\$ • CI Scores <ul style="list-style-type: none"> • Full lifecycle analysis (not just farm) • Process Byproducts <ul style="list-style-type: none"> • Meal • Biowaste • Market Stability <ul style="list-style-type: none"> • Liquid fuel market decreasing? (EV) 	<ul style="list-style-type: none"> • Soy profile <ul style="list-style-type: none"> • Altered to optimize for fuel markets • Compete against EV • Sustainability/CI <ul style="list-style-type: none"> • Soy as the “Sustainable” feedstock • Increase Demand <ul style="list-style-type: none"> • Untapped markets: marine, rail, bioheat • Government mandates • Food AND Fuel balance • Partnerships with Environmental groups • Processing <ul style="list-style-type: none"> • New technologies to make it cheaper • Uses for “biowaste” or soy residue • Value Add/IP <ul style="list-style-type: none"> • Regional incentives • CI premiums?

Strategies

1. Alter soy profile to optimize for fuel markets
 - Get processors to invest in this as it saves them \$\$
2. Build infrastructure/logistics to support value-add/IP opportunities
 - Regional incentives
 - CI premiums?
3. Increase demand/Compete against EV
 - Messaging
 - Partner with industries to expand reach of biodiesel
 - Untapped markets: marine, rail, bioheat, SAF
 - Work towards favorable government policies
4. Continue to build on the soy sustainability story
 - Soy as the “sustainable” feedstock
 - Improve soy’s CI score
5. Find uses for soybean meal and processing byproducts



Plant Protein

Trends	Challenges	Opportunities
<ul style="list-style-type: none"> • Soy is a sustainable source of protein <ul style="list-style-type: none"> • Consumers desire sustainable proteins • Care how its produced • Economics <ul style="list-style-type: none"> • Plant based is more expensive, but decreasing • Health <ul style="list-style-type: none"> • More health-conscious consumers • Taste/Texture <ul style="list-style-type: none"> • Need better taste/texture • Want something more similar to animal foods • Global increased Protein Needs <ul style="list-style-type: none"> • Soybean fits as “worldwide” protein option • Soy can complement, not compete with Animal Ag 	<ul style="list-style-type: none"> • Taste • Consumer Perception <ul style="list-style-type: none"> • Apathy • Soy’s negative reputation • Food Labeling • GMO • Allergenicity • IP Infrastructure <ul style="list-style-type: none"> • Cost/processing issues • Premiums worth it? • Competition against our “base” <ul style="list-style-type: none"> • Competing with animal ag markets? • Demand outpacing supply? 	<ul style="list-style-type: none"> • Improve Taste/Texture • Remove allergens • Whole Farm approach to increase diversity <ul style="list-style-type: none"> • Legume check off? • New business plan • Incorporate peas • “Sell” Soy Benefits <ul style="list-style-type: none"> • Partner with plant-based food as communication ally • Change public opinion • Blend of meat and plant products • Climate benefits • IP <ul style="list-style-type: none"> • Vertically integrated companies • Wildcard <ul style="list-style-type: none"> • Create GMO peas to complicate pea market • Promote soy in improving flavor of meat animals

Strategies

1. Improve Taste/Texture/Allergenicity
 - Understand what consumers want and what they’re willing to pay for
2. “Sell” Soy Benefits to increase demand
 - Partner with plant-based food as communication ally (for both protein and other markets)
 - Blend of meat and plant products
 - Climate benefits
 - Soy as preferred protein source for food aid
 - Expand export of soy flour
3. Build infrastructure to support IP opportunities
 - Vertically integrated companies?
 - More processing opportunities?
 - International demand
4. Whole Farm approach to increase soy yields/profitability
 - Are there ways to incorporate peas into soy rotation



Technology

Trends	Challenges	Opportunities
<ul style="list-style-type: none"> • Disconnect between Innovation & Adoption <ul style="list-style-type: none"> • Fast moving technology • Farmers are slow to adopt • Data required to make decisions <ul style="list-style-type: none"> • Individual (field or farm level) and aggregated data • Automated decision systems are increasing • Data to Demonstrate Sustainability <ul style="list-style-type: none"> • CI/nutrient intensity scores • Ecosystem markets • AI/Remote Sensing <ul style="list-style-type: none"> • Prediction and modeling starting to be used to make decisions • Block Chain 	<ul style="list-style-type: none"> • Cost of Equip • Lack of Communication between Parties <ul style="list-style-type: none"> • Farmers aren't talking to developers (or vice a versa) • Data <ul style="list-style-type: none"> • Privacy • Management/Maintenance • Platforms don't "talk" • Speed of Changes • ROI <ul style="list-style-type: none"> • High risk, unknown return • Funding models to return value back to farm • Complexity • Value to End User <ul style="list-style-type: none"> • No standardizations 	<ul style="list-style-type: none"> • Training/Mentoring Programs <ul style="list-style-type: none"> • Peer to Peer • Integration of Weather Data • Connect Innovators to Farmers • Vetting Technology <ul style="list-style-type: none"> • Role for commodity groups? • ROI <ul style="list-style-type: none"> • Leverage large groups to gain purchasing power and reduce risk • Scalability • Lower costs • Consumer Benefits • Use data to "tell" farmers; story • Streamline Big Data <ul style="list-style-type: none"> • More access to high quality data for farmers • Imagery/Sensors <ul style="list-style-type: none"> • Drive decisions • Underground vs above ground

Strategies

1. Build Training/Mentoring Programs to increase adoption of new technologies
 - Peer to Peer
 - Increase Undergrad Training
 - Extension/Checkoff as the trainers (unbiased/trusted)
 - Cost Share Program options?
2. Connect Innovators to Farmers
 - On-Farm Trials/Demos
 - Partner with industry more effectively
3. Explore role of commodity groups in vetting technology
 - Hub for unbiased data & information
4. Demonstrate benefits to consumers with data
 - Use data to "tell" farmers' stories
 - Sustainability metrics

