

A decorative graphic on the left side of the slide consists of several thin, curved lines in shades of green and grey, and a solid green arrow pointing to the right.

# Connecting the Bio-economy to Rural Policy An Entrepreneur's Perspective

Organisation for Economic Co-Operation and Development

May 21, 2015

# INNOVATION ECOSYSTEM

- Ag Innovation Development Group LLC. is a venture development lab based in the Memphis Bioworks Foundation incubator which is focused on licensing agricultural technology and forming startup companies. [www.aginnovationgroup.com](http://www.aginnovationgroup.com)
- Memphis Bioworks Foundation is a nonprofit incubator and business development organization focused on economic development related to biotechnology including agriculture. Memphis Bioworks has a long standing relationship with USDA, Tennessee Department of Agriculture and Delta Regional Authority. [www.memphisbioworks.org](http://www.memphisbioworks.org)
- Innova Memphis is an early stage venture capital fund created by Memphis Bioworks to invest in new technologies. Innova was recently awarded an Rural Business Investment Company (RBIC) designation from USDA to develop a \$25 million fund to focus on early stage, rural ag deals. [www.innovamemphis.com](http://www.innovamemphis.com)

# BIOECONOMY INNOVATION

Optimizing biological systems for long term sustainability

## Feedstocks

- Commodity Crops
- Alternative Crops
- Waste Products

## Production & Logistics

- Agricultural Production
- Storage
- Transportation

## Manufacturing

- Food & Beverage
- Consumer Products
- Biomaterials & Biofuels



High Value & Low Volume

## Genomics

Nitrogen Efficiency

Biopesticides

New Microbes

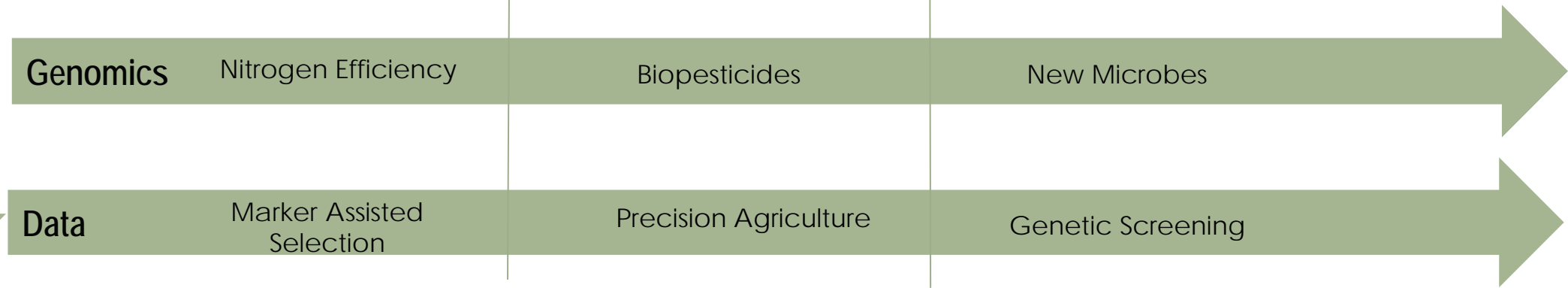
## Data

Marker Assisted Selection

Precision Agriculture

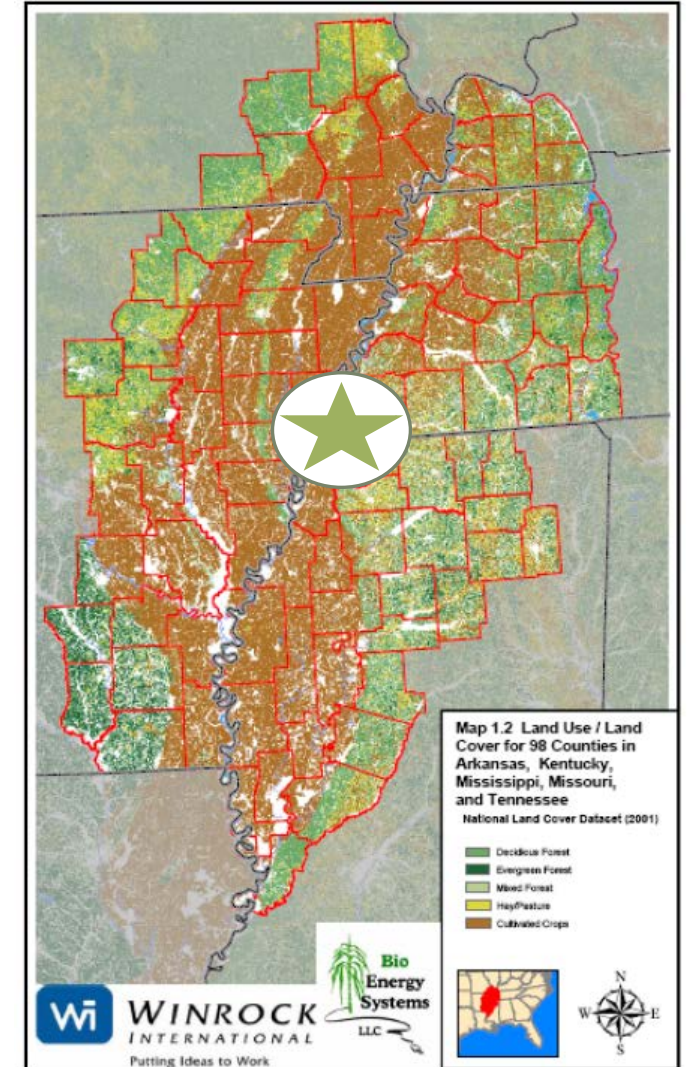
Genetic Screening

Lower Cost & Time



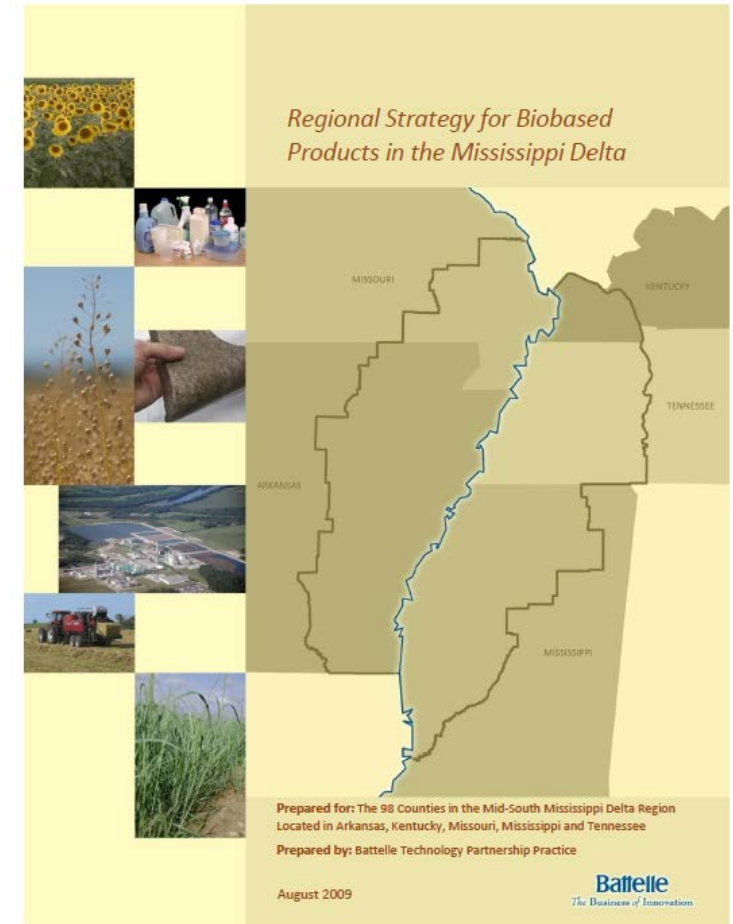
# DELTA REGION PROFILE

- Abundant natural resources (water/soil)
- Diverse crops & livestock with 10s of Billions in farm gate revenue
  - Global commodities: Corn, cotton, soybeans, wheat, rice, sorghum, sugar cane
  - Additional crops: tobacco, peanuts, sweet potato, potato, fruits & vegetables
  - Livestock: beef, dairy, poultry, & pork
- Innovative farmers – early adopters BT/RR traits, Precision Ag, etc.
- Growing local food network & interest in Value-Add (bioproducts)
  - Home to many major ag and food companies (Kelloggs, Unilever, ACH Foods)
- Excellent logistics (air, barge, railroad, road)
  - FedEx (30% biofuels X 2030) – Market Pull
  - Great export opportunities (lowers regional impact of feedstocks)
- Small % of commodities processed in region
- Strong research support from major universities and national labs + technical schools
- *Low education, poor health, concentrated wealth creation, high environmental footprint*



# REGIONAL STRATEGY 1.0

- Combined effort of 23 companies, 27 NGOs and universities, 5 states (AR, KY, MO, MS & TN) – led by Memphis Bioworks
- Examined crop production patterns, industrial and farm processing assets, and logistics
- Sustainably grown and harvested biomass in the region surrounding Memphis can adequately supply an \$8 billion USD biofuels and biobased products industry while enhancing the food and feed supply chain
- The transformation to a bioeconomy could support over 50,000 jobs within the next two decades in both rural and urban locations
- The bioeconomy will open up markets for alternative crops which will increase crop diversity, less inputs and increase options for local farmers
- The bioeconomy will contribute to reduced greenhouse gas emissions, increased air quality and other environmental benefits





# PILOT PROJECT EXAMPLES

- 1<sup>st</sup> step toward local supply chains at scale
- Sweet sorghum production supplying commercial scale loads of sugar to local yeast manufacturer and ethanol producer
  - Drought tolerant rotation crop
  - Reduces nematodes in other row crops
  - Has diverse markets in food/beverage and bioproducts/biofuels
  - Established company – Delta Biorenewables to expand acreage and processing in the region
- Winter oilseeds in partnership with local manufacturers
  - Millions of acres of winter production land
  - Great rotation crop (nematodes)
  - Established company – BioDimensions Renewable Oils to expand acreage and processing in the region
- Key learnings: introducing new crops at scale is extremely difficult – infrastructure costs, crop insurance, working capital, genetics, agriproduct labeling, farmer acceptance...



# CASE STUDY: SWEET SORGHUM



# REGIONAL STRATEGY 2.0

## 1.0 New Supply Chain & Value-Added Processing

*Strategy:* Replacing small % of export raw commodities such as corn and soy with valued added products from winter oilseeds, sorghum, and biomass

2009 Battelle study: 50,000 potential jobs in 5 state region, repurposing small % of existing farm production (salary \$20K+)

*Challenges/Opportunities:* macro economics, biotech, time to market, regulatory barriers, crop insurance, large capital investment needed; breeding; etc..

*Highlights:* Multi-year farm scale trials; processing incubator capabilities; university partner grants (ex: Murray State \$309K and ASU \$287K)

PROFITABLE

## 2.0 Agricultural Innovation Commercialization

*Strategy:* Leverage \$5 Billion annual academic research investment in Southeast into job creating startups focused on tools to help farmers be more profitable and sustainable

High quality jobs centered in "rural innovation clusters" (salary \$40K+)

*Challenges/Opportunities:* focus areas include: precision agriculture and biologic pest control; access to early stage capital; expand accelerator/incubator support

*Highlights:* model accelerator in NWTN (9 startups) ; formed AgIDG; leading TN Governor's Rural Challenge innovation strategy; pursuing RBIC with Farm Credit

PROFITABLE

TIME TO MARKET

3 Years

6 Years

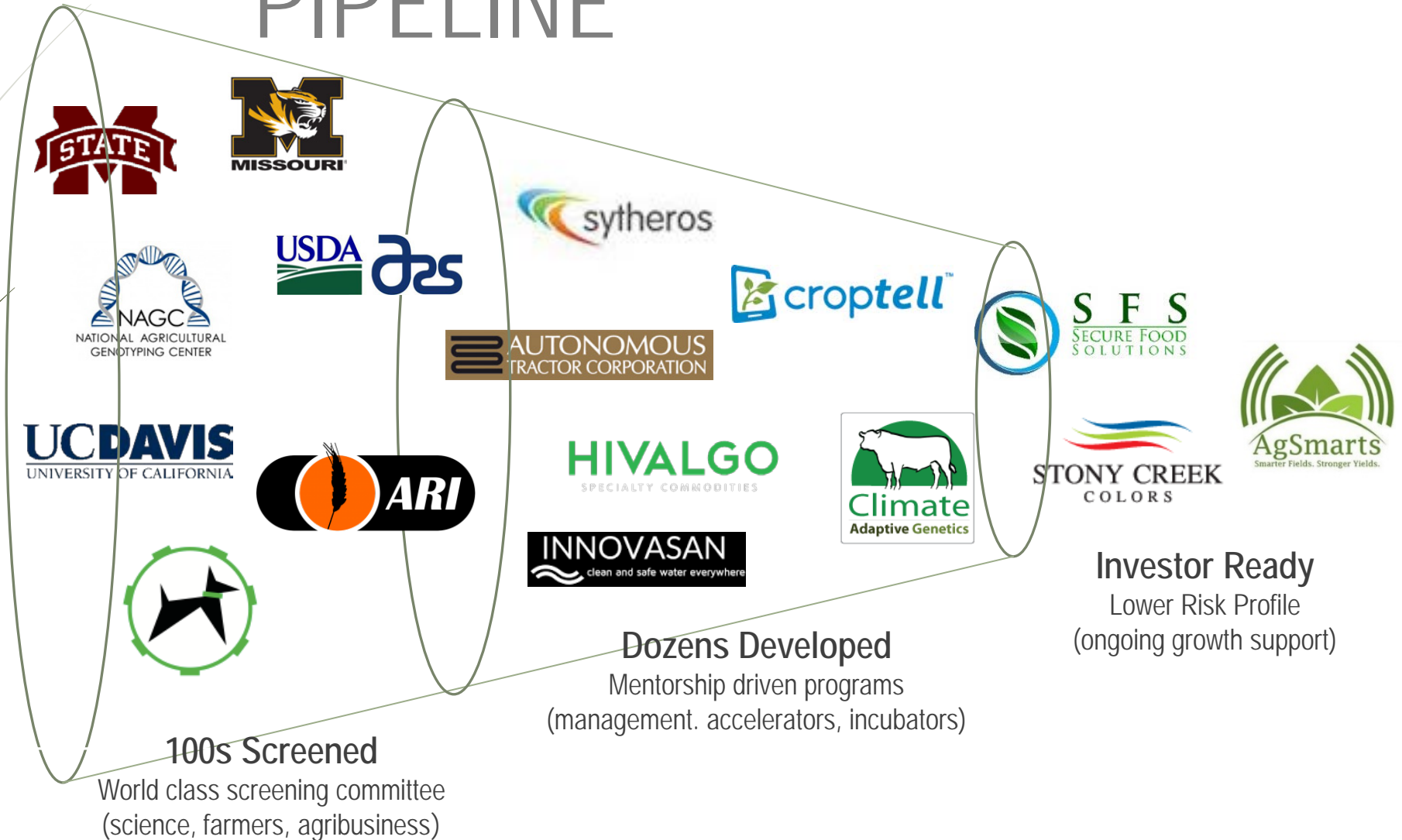
9 Years

12 Years

15 Years



# ENTREPRENEURIAL PIPELINE



# COMMENTS

- How much is feedstocks and how much is people (or other)?
- Systems view of innovation (deal flow, entrepreneurship development, venture funds)
- Don't pick winners –key metric: does it add value and create local jobs?
- Market development view that is free from constraints (lower tech costs + high value markets)
- Lower regulatory burdens/fast track for startups (herbicide carryover, new traits, crop insurance))
- Encourage public research facilities to incubate startups & mechanisms to connect research to commercialization (\$5.1 B to \$44 M, 2009-2011)
- Models to partner with farmers (VAPG, Farmer Networks, Iowa Corn)
- Financial instruments that encourage ag & forestry diversity (like CRP) & unique mechanisms to fund crop diversity (checkoff-of-checkoffs)
- Incentivize appropriately staged private venture capital (leveraged RBIC)
- Knowledgeable technical & business support (RBDG) & increase support for accelerators
- Increase connectivity to existing agriculture & forestry assets – we already have the foundation of the bioeconomy



# THANK YOU!



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