



Investments in Sorghum: Past, Present and Future John Duff ABFC2016













WHY?



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- Sorghum is a known crop many farmers have grown at some point
- There is ample information available on growing sorghum
- Sorghum is an annual, so it will not tie up land
- Sorghum can be rotated
 - Farmers can try sorghum at least once
 - Sorghum can be rotated in system with crops like beets
 - Rotation prevents disease and other pests from causing agronomic and environmental issues





- Sorghum has a well-established seed industry founded in the 1950s
- Seed supply issues can be easily addressed
- Any hybrid can be readily produced using existing infrastructure









- Average sweet sorghum yields are about 28 tons per acre (450 gallons of ethanol and eight tons of bagasse)
- Average biomass sorghum yields are about 11 bone dry tons per acre (1,000 gallons of ethanol)
- Data exist showing sweet yielding 72 tons per acre and biomass yielding 26 bone dry tons per acre
- These only represent the industry's most recent attempts at breeding for sugar and cellulose yield





- Water-sipping
- Grain sorghum uses one-third less water than other grain crops
- Sorghum silage uses half the water that other silage crops use
- Sweet sorghum uses half the water that other sugar crops use

Water availability is already a huge concern around the world









- Sorghum can be grown in northern areas
- When used as a secondary feedstock to corn stover or other crops, sorghum's benefit in the north is even better
- Sweet sorghum for syrup is produced as far north as Minnesota and Wisconsin





- Sorghum can produce sugar, starch and cellulose, all in a single species, and possibly all at the same time in a single plant
- One of the most diverse species on Earth

Our breeders can customize the crop to fit your needs





- Dry stalk for better biomass harvest or not
- Naturally senescent or not
- BMR, lower fiber
- Higher fiber
- High sugar
 - High fructose
 - High glucose
 - Higher sucrose
- Heads for greater starch content
- No head



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SORGHUM: THE CHOICE TWO Organizations Advocating for Sorghum



- Primary activities are research and marketing
- Cannot lobby
- Funded by producer checkoff dollars
- Organized in 2008



- Primary activities are policy and regulatory advocacy
- Funded by voluntary membership dues
- Organized in 1955















WHO AND HOW MUCH?







- Sorghum Checkoff
- USDA-ARS
- USAID
- Kansas State University
- Texas A&M University
- NexSteppe
- Chromatin Inc.



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- DOE to the tune of over \$70 million
 - ARPA-E program centered around sorghum, TERRA, has brought many new players to the sorghum table
 - What do these organizations have in common?
 - Donald Danforth Plant Science Center
 - University of Illinois, Urbana Champaign
 - Texas A&M University
 - HudsonAlpha
 - Washington University in St. Louis
 - Kansas State University















- Clemson University
- Carnegie Mellon University
- Blue River Technology Inc.
- Lawrence Berkeley National Laboratory
- Pacific Northwest National Laboratory
- IBM Research
- Chromatin Inc.
- National Robotics Engineering Center
- Cornell University
- Signetron Inc.



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They are all invested in sorghum



















QUESTIONS?



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