

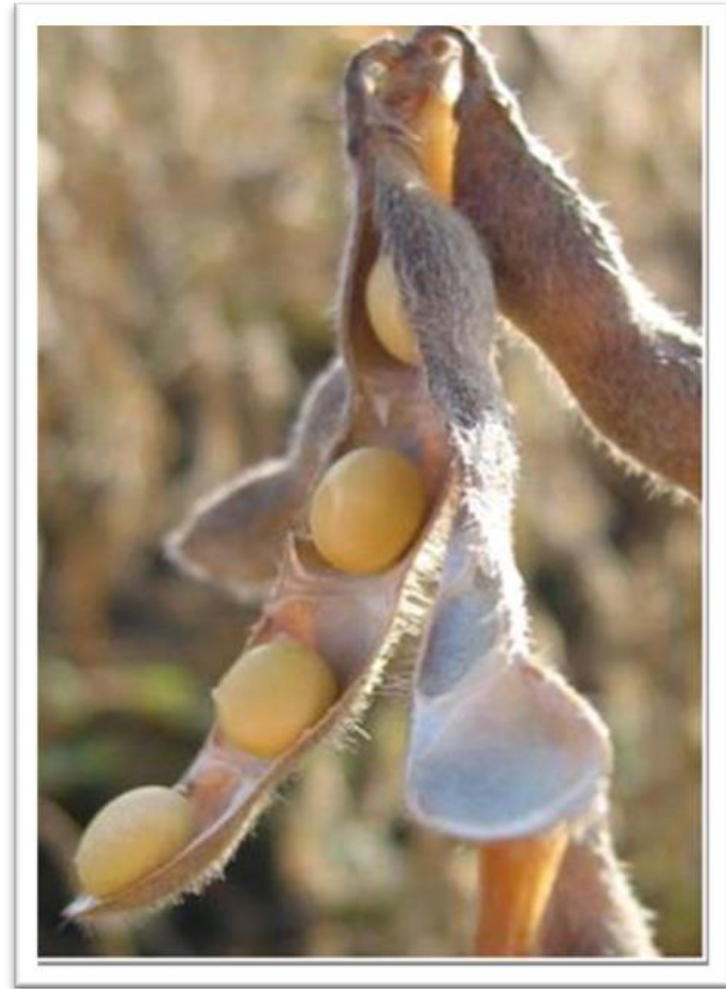
4TH NATTO SUMMIT

FUTURE OF NON-GMO NATTO SOYBEAN PRODUCTION

November 2022

Agenda

- Industry changes
- Production challenges
- Crop Insurance effects
- Producer attitude



Industry Changes

Grain Handling and Crush Plant Expansion for 2022 – 2024



10 New Crush Facilities

5 Crush Expansion

7 Grain Handeling (New and Exp)



What does this mean for soybean production?

- Demand will be strong for acres....Industry projection is to need 20% more soybeans planted by 2024. All GMO.
Ex.: North Dakota....2 new facilities means 50% of production will move to crushing facilities. Can expect higher cash prices (tighter basis) compared to CBoT mkt.
- Can large grain handling facilities survive?
- Tightening crop rotations....corn & soybeans across Midwest?
- Farmers always have freedom to choose!



Production Challenges

Weed Control



SPECIALTY SOYA AND GRAINS ALLIANCE

- No. 1 challenge for producers. Old herbicide chemistry means minimal choices. No longer effective and weed resistance continues to grow. No new herbicide chemistry available.
- Pre-emergence herbicides are most effective, but must have rain within 24-36 hours to insure control.
- Must still apply post-emergent herbicides prior to plant flowering & hope for good control environment
- Smaller natto plant canopy allows later season weed emergence
- Weeds rob yield potential -- farmers do NOT like weeds and pressure from landowners

Weed Control – New Technologies

- John Deere See & Spray Ultimate Sprayer
- Autonomous sprayers – Swarm Farm & Monarch
- Carbon Robotics -- Laser technology
- Verdant Robotics – Laser technology
- Nexus – Farm Forward – Pulling weeds
- University & other private industry efforts
- Drones
- Kate Warpeha – National Science Foundation
- Grand Farm – global innovation platform

Grand Farm

- Grand Farm Research and Education Initiative (Grand Farm), is a North Dakota organization facilitating collaboration and research into agriculture technology.
- Grand Farm brings together researchers, growers, industry, startups, and government to collaborate and develop innovations impacting agriculture including equipment advancements, automation, soil health, carbon, connectivity, cybersecurity, and traceability.



Genetics

- Supplier investments
 - A. Higher yield -- difficult with small seed size
 - B. More dense and wider plant canopy
 - C. Disease resistance
- Lack of knowledge on what's important internal composition criteria that can improve natto quality.
 - A. Taste
 - B. Texture
 - C. Shelf life
- What do we know about Hikiwari as it relates to above?
- Grower's perception is our natto soybean genetics are inferior



Production Costs

- Labor shortage & lack of available experience
- Input costs
 - A. Fertilizer & Fuel – 2-3 times higher
 - B. Land cash rents
- Equipment costs and availability
- Interest rates for operating loans
- Crop storage management & delivery
 - A. Producer investments
 - B. Climate advantages



High CBoT Prices

- Incentive and passion to participate reduced
- Crop premiums must compete
- Each producer has their own production calculations and variables to consider for participation.
- Not only about competition from GMO soybean production
- Education is important



Crop Insurance Effects



- Crop insurance protection is based on yield history
- Lower yielding varieties reduce proven yield history and affect decision to participate.
- Insurance claims are based on local market price, not premium value.
- Ex. 5 year proven yield history = 50 bus/acre
 - A. Farmer buys insurance to protect 80% -- means that if production drops below 40 bus/a, he collects.
 - B. If 5 year proven yield history drops due to 1-2 years of natto soybean production, then the relative yield protection also drops, causing farmer to re-consider participating.

Producer Attitude

- Profitability is critical – producers have options
- Corn is still King – will this change?
- **Desire to get closer to the food industry**
-- **Production with a Purpose – getting to know food manufacturer**
- Producers concern about planting soybean varieties with more production risk – ROI stability?
- Producers realize need to invest into improved handling & storage
- Baby Boomer vs Millennial producers



SUMMARY

THANK YOU!

Questions?



New Technology Videos

- [Nexus Robotics](#)
- <https://www.deere.com/en/sprayers/see-spray-ultimate/>
- <https://vimeo.com/laserweeder/carbonrobotics>