CULTIVATOR BREAKFAST

Round Table Meeting June 2023

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Moderator
Jenna Wicks

Program Manager
Farm Foundation

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2023 JUNE CULTIVATORS

Sophia Darrow
Oklahoma State University

Gustavo Castro García
University of Nebraska-Lincoln

Elizabeth Lynch
West Virginia University

Joseph Oboamah
University of Nebraska-Lincoln

Guang Tian
University of Wisconsin-Madison

Carolina Vargas
Michigan State University

Thank you to BNSF and the Round Table Fellows for your support of the Cultivators Program!

BNSF RAILWAY

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Sophia Darrow

Oklahoma State University

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Addressing Food Insecurity

By: Sophia Darrow

- Introduction to food insecurity, food deserts, & horticultural prevalence
- Current Technologies and Strategies
  - Urban Farming
  - Vertical Farming
  - Farmers' Market
  - Additional Programs
- Added Benefits from fighting food insecurity
  - Agricultural & Scientific
  - Social
- Success Story
- Closing

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Gustavo Castro García

University of Nebraska-Lincoln

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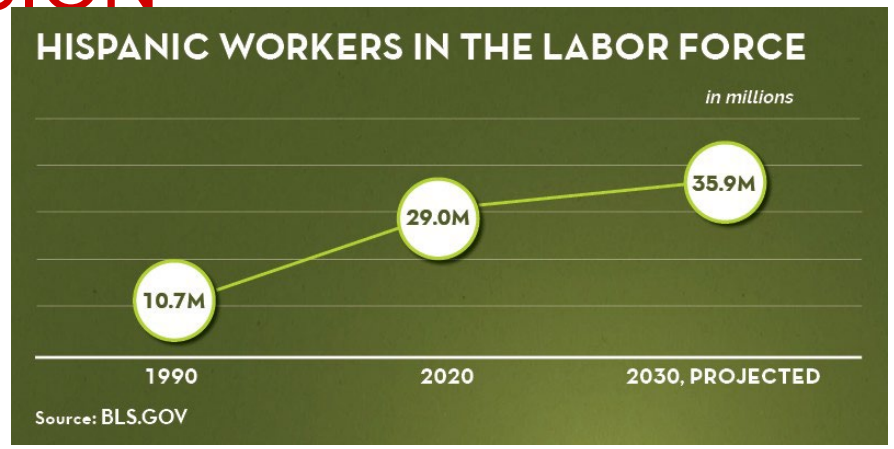
Preparing a diverse agricultural workforce to achieve agricultural sustainability goals

Mapping a Successful Future for Food and Agriculture
June 14 -16 2023

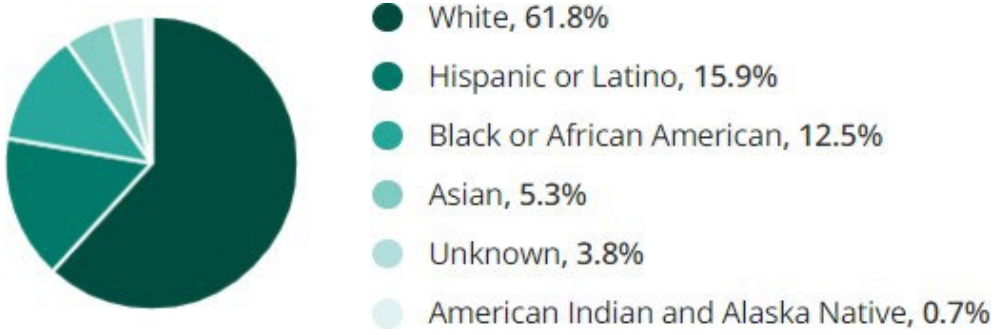
Gustavo Castro, Ph.D. Student. gcastrogarcia2@huskers.edu.co
Biological Systems Engineering
Dr. Amy Schmidt. aschmidt@unl.edu
Professor. Departments of Biological Systems Engineering & Animal Science

IN OUR GRIT, OUR GLORY™

CURRENT CULTURE IN U.S. AGRICULTURE & EXTENSION



Agricultural Extension Agent Demographics in the U.S. (2023)



OBJECTIVES

1. Evaluate perceptions of education and training opportunities in agriculture and extension among first- and second-generation Latinos/Hispanics living in the U.S.
2. Identify barriers of Latinos/Hispanics to seeking agricultural extension training and careers in the U.S.
3. Develop pathways for Latino/Hispanic college students to pursue extension experiences at U.S. land-grant institutions.

AGRICULTURAL EXTENSION PROGRAMS ENGAGEMENT

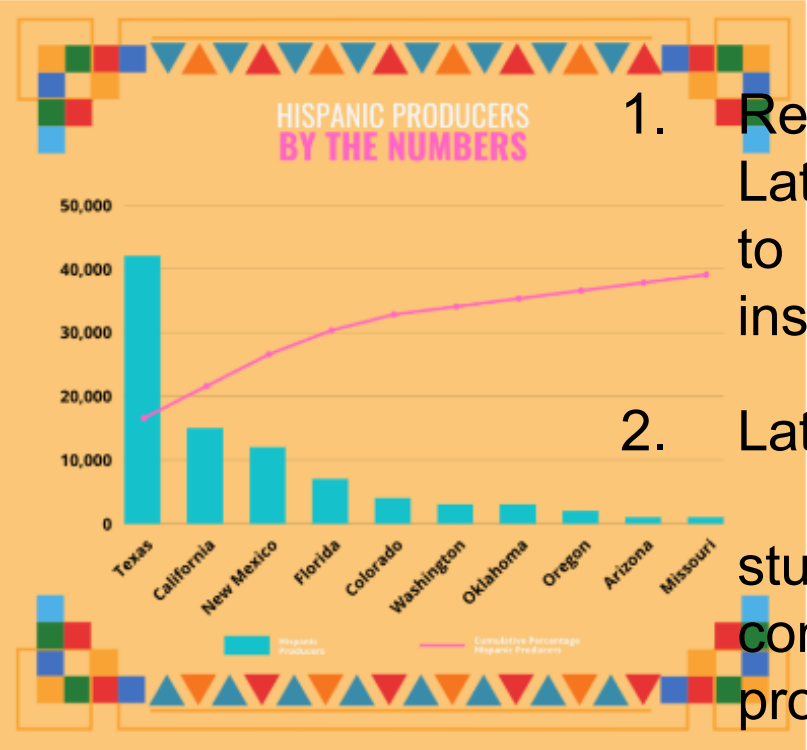


Chart showing number of Hispanic producers in various states, the largest amount being in Texas, California and New Mexico. (Texas A&M AgriLife graphic with statistics courtesy of the U.S. Department of Agriculture National Agricultural Statistics Service)

INTENDED OUTCOMES

1. Recruitment of Latino/Hispanic students to U.S. land-grant institutions increases.
2. Latino/Hispanic students successfully complete educational & professional training programs in agriculture and extension.
3. Latino/Hispanic extension professionals contribute knowledge and skills to improve U.S. agricultural sustainability.

********agrilifetoday.tamu.edu/2022/10/05/agrilife-extension-led-project-will-help-hispanic-farmers-ranchers/

Welcome Questions & Comments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Elizabeth Lynch

West Virginia University

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Bridging the Gap Between Producers and Consumers Through Advocacy and Research

Advocacy

Miss America + WVU

Research

ELSEVIER

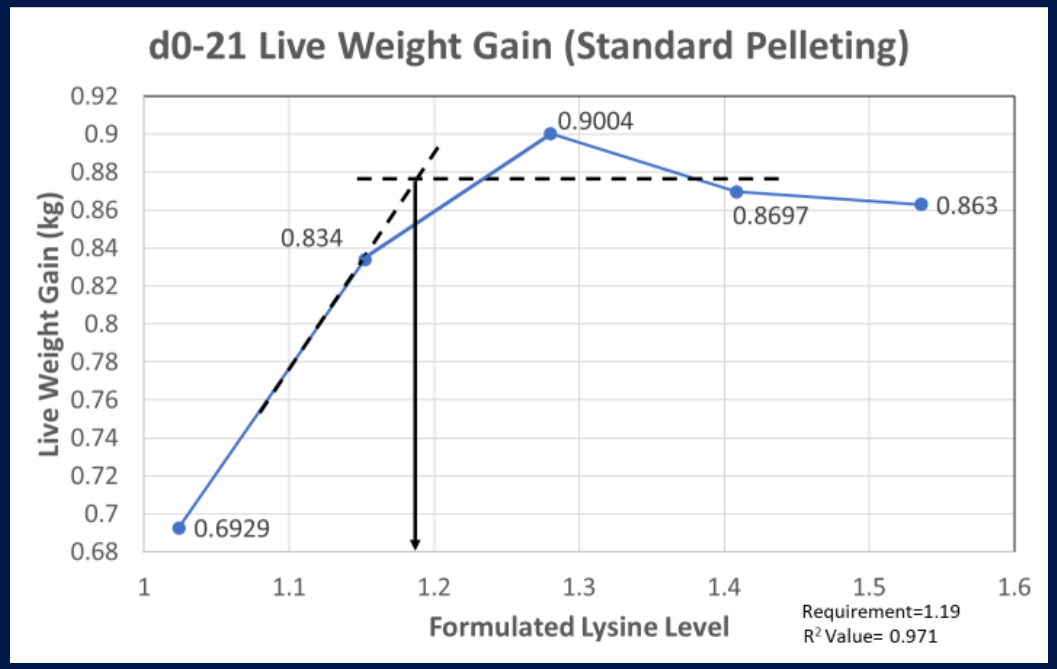
Journal of Applied Poultry Research

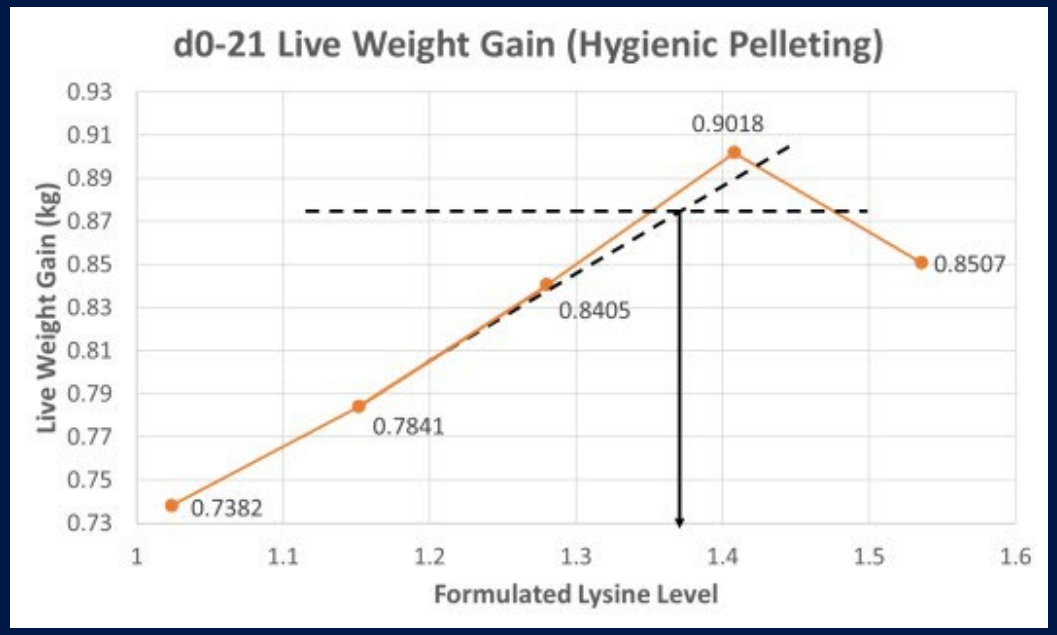
Available online 6 May 2023, 100355

In Press, Journal Pre-proof What's this?

Hygienic Pelleting Can Decrease Hubbard x Ross 708 Apparent Ileal Amino Acid Digestibility, Broiler Performance, and increase Digestible Amino Acid Requirement

Elizabeth Lynch [1], K. Bowen [1], V. Ayres [2], T. Boltz [3], K.G.S. Wamsley [3], J.W. Boney [4], J. Moritz [1]





Why Does it Matter?

- 2022 per capita meat type poultry consumption (USDA)
  - 96.8lbs-Broilers
  - 15.5lbs-Turkeys
- 2019, US per capita consumption of eggs reached 288 eggs (USDA)
- Application for other species
- Nutritional detriment  hygienic pelleted feed
- Budget for increase in feed costs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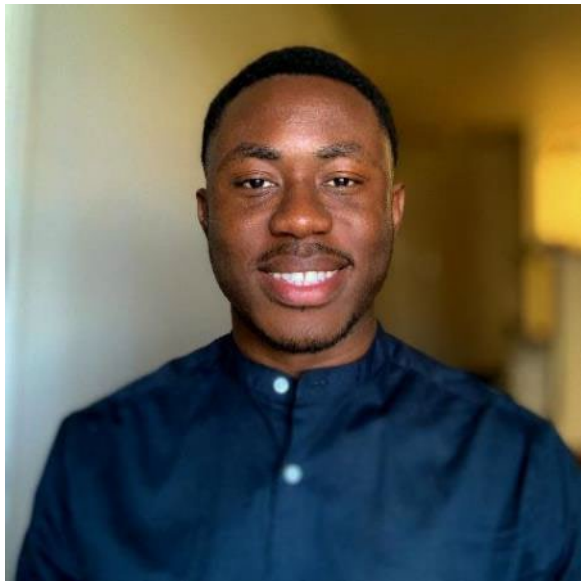

Joseph Oboamah

University of Nebraska-Lincoln

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Utilizing Computer Science to Innovate Agriculture

Joseph Oboamah

Xin Qiao*, Wei-zhen Liang

University of Nebraska-Lincoln

Panhandle Research and Extension Center

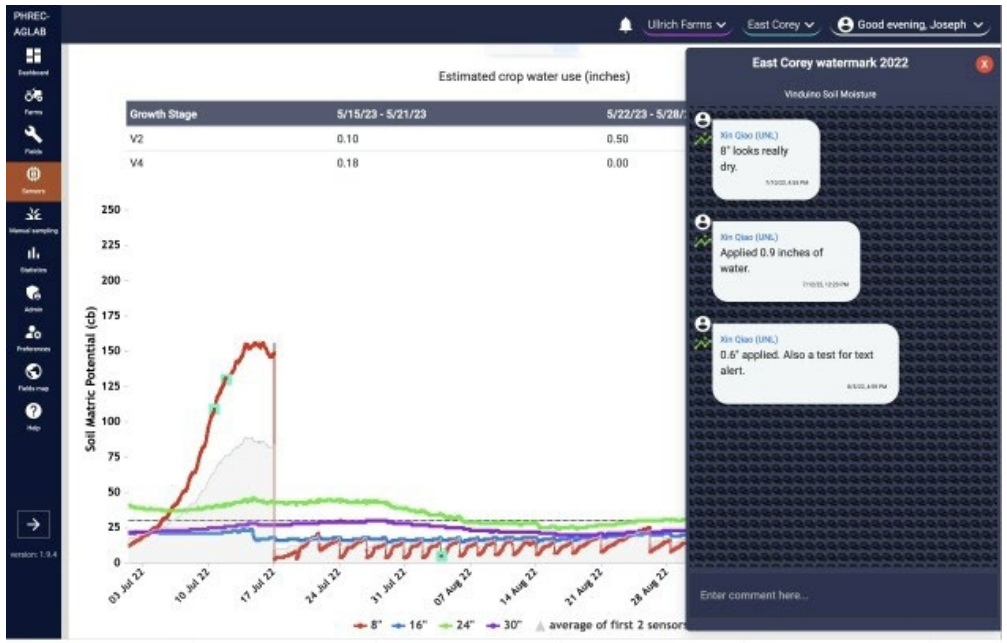
USDA United States Department of Agriculture

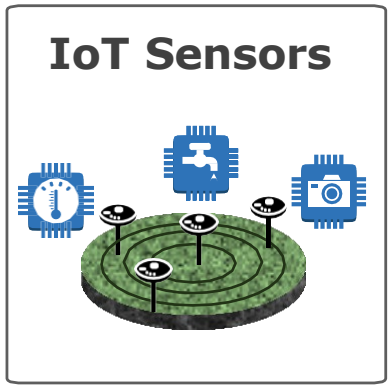
ethos CONNECTED

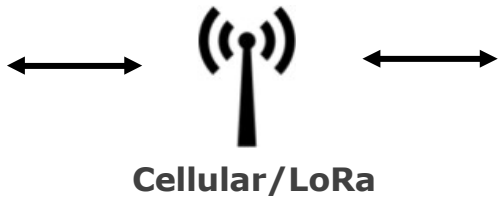
Western Sugar Cooperative GROWER OWNED

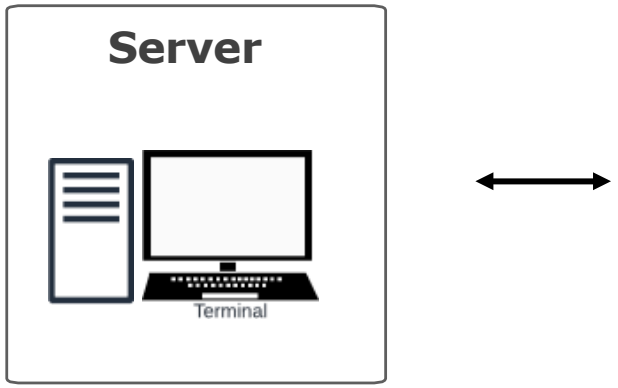
Simplot GROWER SOLUTIONS

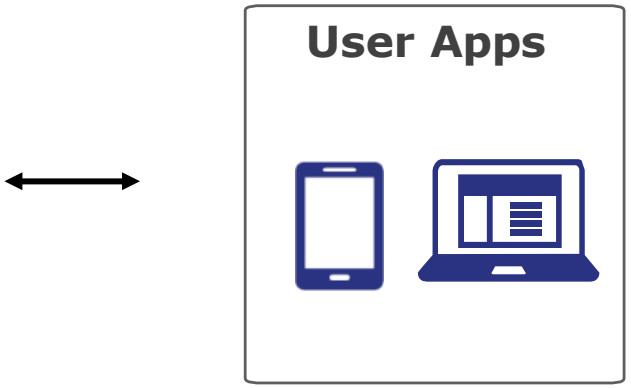
Peer Learning Agricultural Network (PLAN)



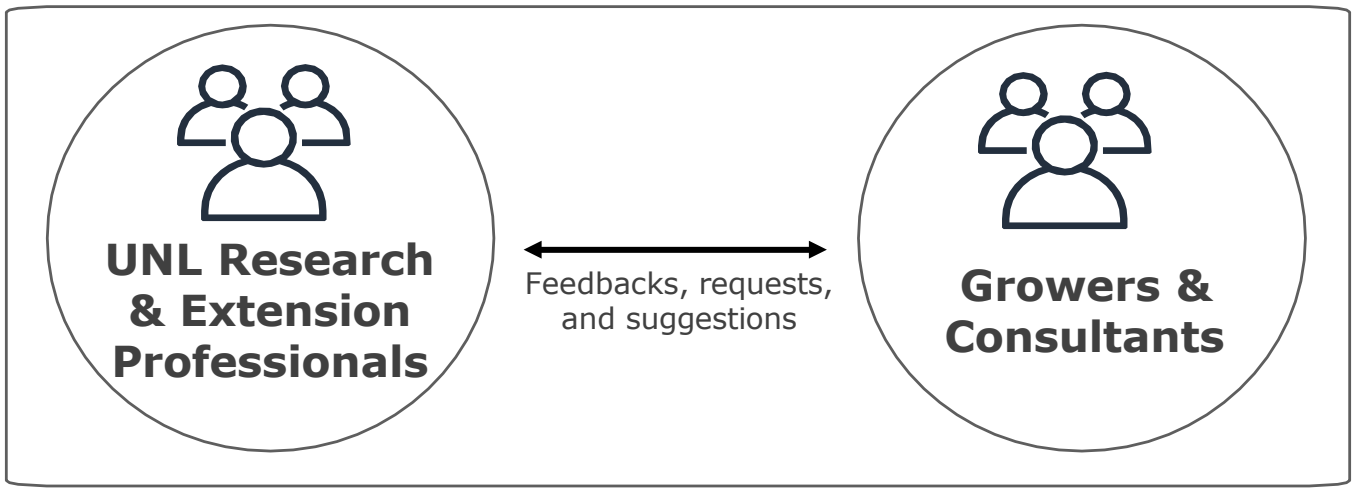








User interactions: chats, emails, alerts, and text notifications



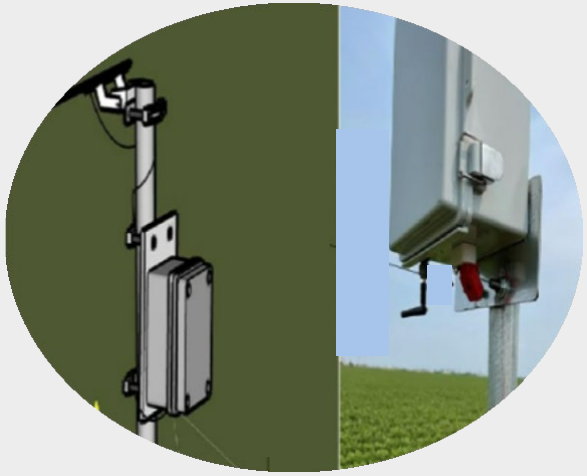
********phrec-irrigation.com/#/farms

Other Projects

FlowCAM

- Uses computer vision and the power of machine learning to extract flowmeter readings.
- Sends the extracted data to PHREC server via LoRaWAN.

CanopyCAM



- Uses computer vision and in-house-built algorithm to calculate crop canopy.
- Sends calculated data to PHREC server via LoRaWAN.

Disease Monitoring

- A cloud-based disease monitoring system for:
  - Cercospora Leaf Spot on sugar beets.
  - White Mold on beans.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Guang Tian

University of Wisconsin-Madison

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Impacts of Climate Change and Adaptation on Crop Quality:

Evidence from U.S. Soybean*

Guang Tian,

Department of Agricultural& Applied Economics,

University of Wisconsin-Madison

*This research will be presented at ***Agricultural & Applied Economics Association*** annual meeting at Washington, D.C., July 23- 25, 2023.

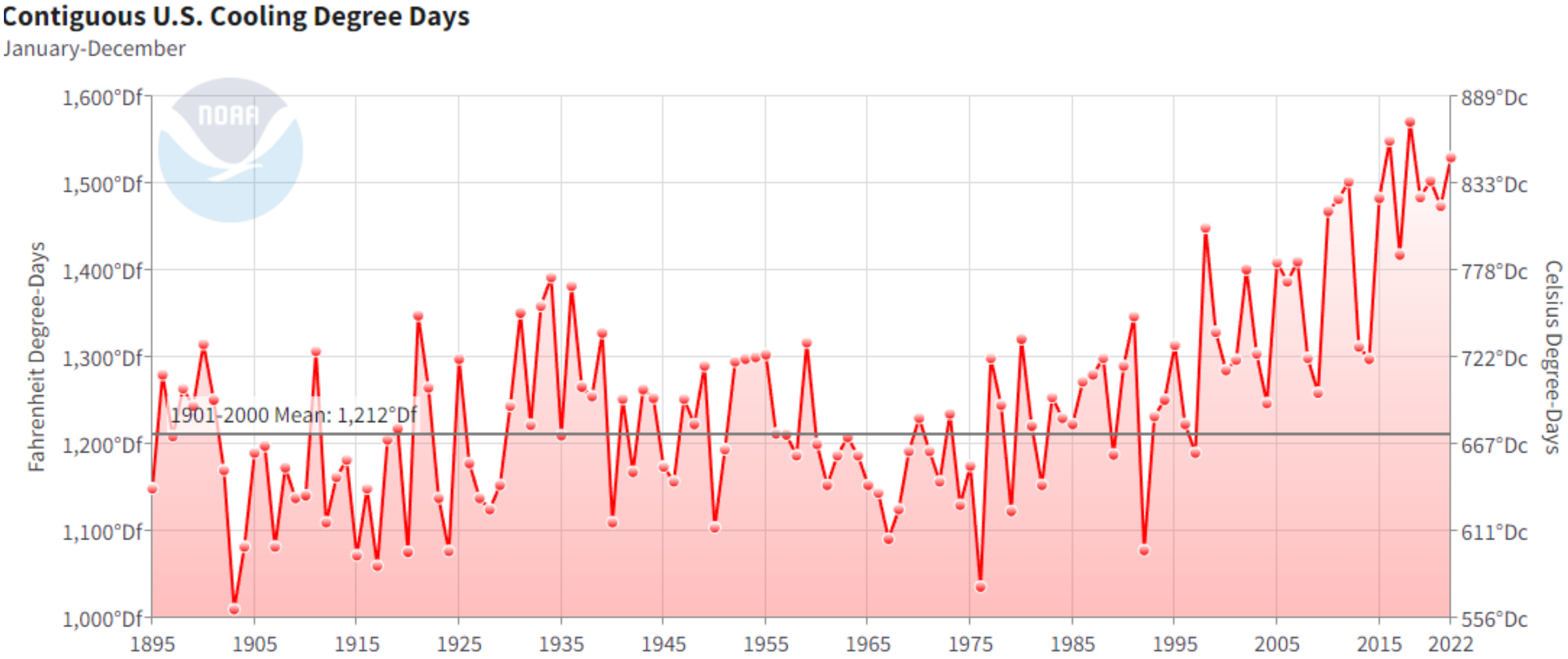
Introduction

- The United States produces 31% of the world's soybeans and is the 2nd largest producers worldwide(USDA, 2022).

- Soybean provides critical calories for animal feed and human consumption.

- Soybean protein content (quality) is important for both usages.

Weather changes



Source: National Oceanic and Atmospheric Administration

Planting Progress

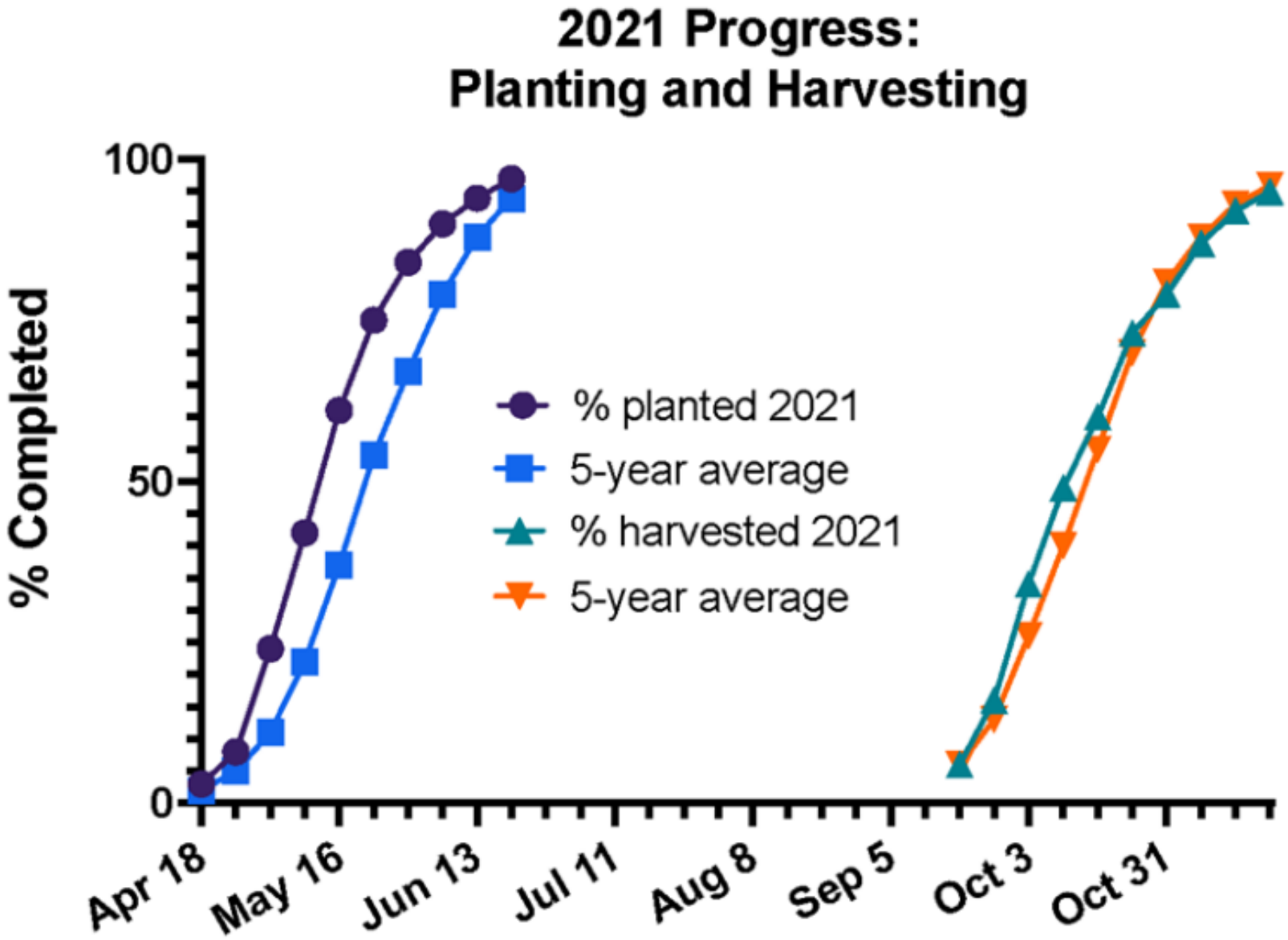


Figure 1 source: USDA NASS

Results& Implications

1. Soybean farmers plant earlier than before.

2. Planting early  high yield but low protein content.

3. Trade-off between yield and quality.

4. In the long run, low protein content soybean may change U.S. soybean comparative advantages in international market.

Appendix

Table 3: Yield, Protein and Planting Progress

VARIABLES	(1) yield	(2) yield	(3) yield	(4) protein	(5) protein	(6) protein
Progress(%)	0.00590***	0.0121***	0.00619***	-0.00314*	-0.00463***	-0.00548***
	(0.00122)	(0.00100)	(0.000891)	(0.00177)	(0.00161)	(0.00178)
Year		0.0444***	0.0530***		-0.0728***	-0.0722***
		(0.00449)	(0.00318)		(0.00717)	(0.00649)
CDD		-0.000549***	-0.000597***		0.000363***	0.000456***
		(3.90e-05)	(6.88e-05)		(6.62e-05)	(0.000114)
Precipitation		0.0218***	0.0163***		0.0120***	0.00538
		(0.00192)	(0.00227)		(0.00319)	(0.00436)
Constant	2.598***	-87.54***	-104.1***	34.75***	180.5***	179.6***
	(0.0765)	(9.050)	(6.379)	(0.111)	(14.44)	(13.05)
Observations	404	404	404	399	399	399
R-squared	0.055	0.462	0.7793	0.008	0.321	0.5192
State FE	NO	NO	YES	NO	NO	YES

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

*Planting Progress is the percent of soybean sowing finished by the week 21.

*CDD is cooling degree days defined by NOAA. Degree days are the difference between the daily temperature mean, (high temperature plus low temperature divided by two) and 65°F. If the temperature mean is above 65°F, we subtract 65 from the mean and the result is Cooling Degree Days.

*Unit of yield is MT/ha.

*Protein is measured at % weight of protein out of soybean.

*Unit of precipitation is inches.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Violence Incidence and other shocks on the Food Supply Chain: the case of Maize Traders in Nigeria and Milk Farmers in Colombia

Carolina Vargas

June 15th, 2023

Farm Foundation Cultivators Program

Why Violence? What are we missing?

The dynamics of violence impose shocks on the general population that can cause devastation and limit market transactions in agriculture (George et al. 2021, Arias et al, 2017, and Bozzoli & Brück, 2009):

- Rural labor supply
- Welfare
- Food security

Gaps:

- Impact of violence on farmers but not other segments (downstream actors)
- Focus on farmer decisions but not farmer exposure (who are the victims?)
- Other meso-level variables are excluded: urbanization

Objective: Understand the inter-relationship between violence, urbanization and actor characteristics and their effects on the structuring of agrifood value chains

COLOMBIA

50 year conflict:

- FARC, ELN, Paramilitary and criminal bands

How do violence levels and territorial characteristics of secondary/tertiary cities and their catchment areas have and effect on:

1. Milk farmers market channel choice (between modern and traditional)?
2. Decision of milk farmers to adopt different technologies associated to breeding, pasture management and milking practices?

Surveyed 1,200 Milk farmers in the South West regions of Colombia between December 2018-Jan 2019

NIGERIA

- Boko Haram, the farmer-
  banditry and Corruption

Which types of maize trade
violence;

- Does the violence tend to ha
  and rural traders more than
  traders?

Do violent shocks to traders
confluence of other shocks?

Surveyed 1,100 Maize trad
the biggest maize

RESULTS: COLOMBIA

1. Violence levels and urbanization levels have a joint effect on both t of selling to the modern market channel:
   - In municipalities with small urban centers (15k-60k) higher violence levels de probability by 73 percentual points
   - No effects on more urbanized municipalities
2. Violence's adoption effect varies across technologies:
   - In more urbanized municipalities, violence index reduces use of feed by 0.1
   - 7 percentage point lower probability of using fertilizer and herbicides
   - In less urbanized municipalities violence is positively associated with the ac insemination

RESULTS: NIGERIA

1. Female traders have a higher chance of experiencing a violent shock:
   - 53 percentual points in a Boko Haram attack, 20 by farmer herder conflict, 19 by general banditry
2. Urban traders have a higher probability of experiencing violence, particularly from Boko Haram and Banditry
   - 45 percentual points in general violence, 84 by Boko Haram and 27 by banditry
3. Experiencing other shocks increases the probability of experiencing a violent shock
   - Price shocks increase the probability experiencing violence shock by 29 percentual points
   - Traders that experienced a severe COVID shock, were 36 perceptual point more likely to experience a violence shock


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