



United States Department of Agriculture
National Agricultural Statistics Service



USDA Crop Data Collection

Agriculture Workgroup Conference Call

**Lance Honig, Chief
Crops Branch
USDA-NASS**

March 17, 2022



Topics



About NASS

Roles Within USDA

Census vs Annual Program

NASS Crop Estimating

Disclosure

Transparency

Looking Ahead

To provide timely, accurate, and useful statistics in service to U.S. agriculture.

[illegible]

- **~120 Crop Commodities**
- **~40 Livestock Commodities**
- **~400 National Reports Annually**
- **Census of Agriculture**

Non-Policymaking Non-Political

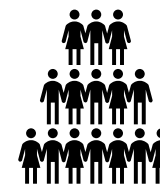
WHY NASS PUBLISHES ESTIMATES

Used by...

- Farmers
- Policymakers
- Agribusinesses
- State & Local Government
- Researchers
- USDA
- Etc.

Used for...

- Marketing Decisions
- Designing Programs
- Product Distribution
- Local Programs
- Varietal Improvements
- Designing & Administering Farm Bill Programs
- Etc.



Levels the Playing Field

Equal Access

NASS

Unbiased

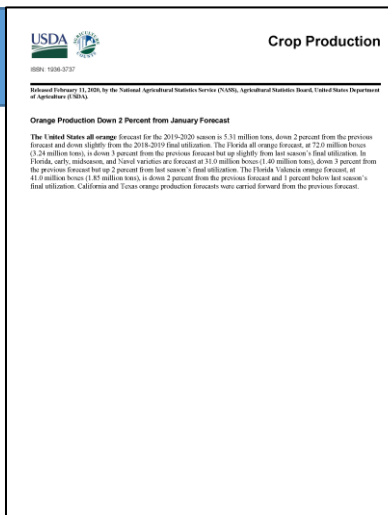


Who's Responsible for USDA Estimates



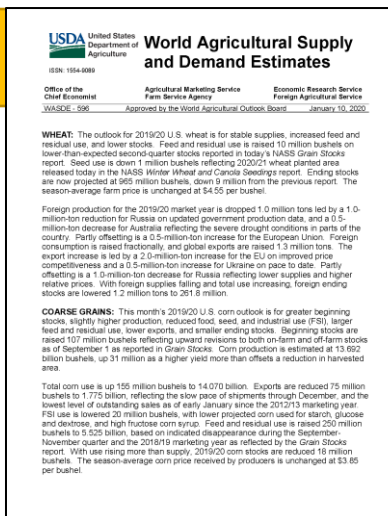
National Agricultural Statistics Service (NASS)

- USDA's Statistical Arm
- Measure all aspects of agriculture in U.S.
- Monthly *Crop Production* Reports



World Agricultural Outlook Board(WAOB)

- Office of the Chief Economist
- Projections for the World
- Monthly *WASDE* Reports



WAOB FUNCTION

Provide economic information & coordinate USDA's World Agricultural Supply and Demand Estimates (WASDE)

Coordinate Analysis Across Agencies

- World Agricultural Outlook Board (**WAOB**)
- Agricultural Marketing Service (**AMS**)
- Economic Research Service (**ERS**)
- Farm Service Agency (**FSA**)
- Foreign Ag Service (**FAS**)
- Grain Inspection, Packers, and Stockyards Administration (**GIPSA**)

Nine Interagency Commodity Estimates Committees (ICEC)

- **Wheat**
- **Rice**
- **Feed Grains**
- **Oilseeds**
- **Cotton**
- **Sugar**
- **Meat Animals**
- **Poultry**
- **Dairy**



Other USDA Data



Farm Service Agency (FSA)

- **Administers Numerous USDA Farm Programs**
 - **Certified Acreage**
 - **Limited Acreage Failed Data**
 - **Prevent Plant Acreage**

**Most Useful for
Planted Acreage**

**Summer
Reporting
Deadlines**

Risk Management Agency (RMA)

- **Administers Crop Insurance Program**
 - **Acreage and Yield Data for Insured Crops**
 - **Acreage Failed Data**

**Both Planted
Acreage and Yield**

**Yields Reported
After Harvest**



Who's Responsible for USDA Estimates



2022-2023
Corn/Soybeans

WAOB

NASS

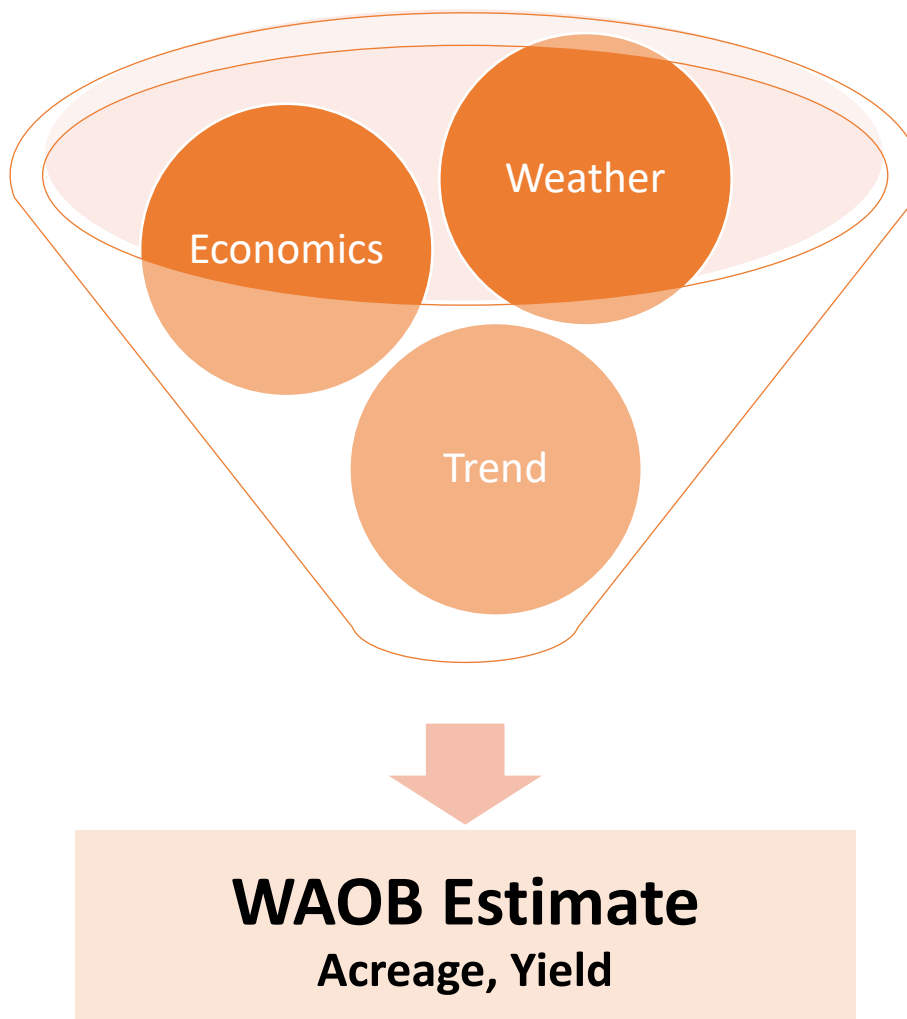
Harvested Acres: End of June

Yield/Production: August

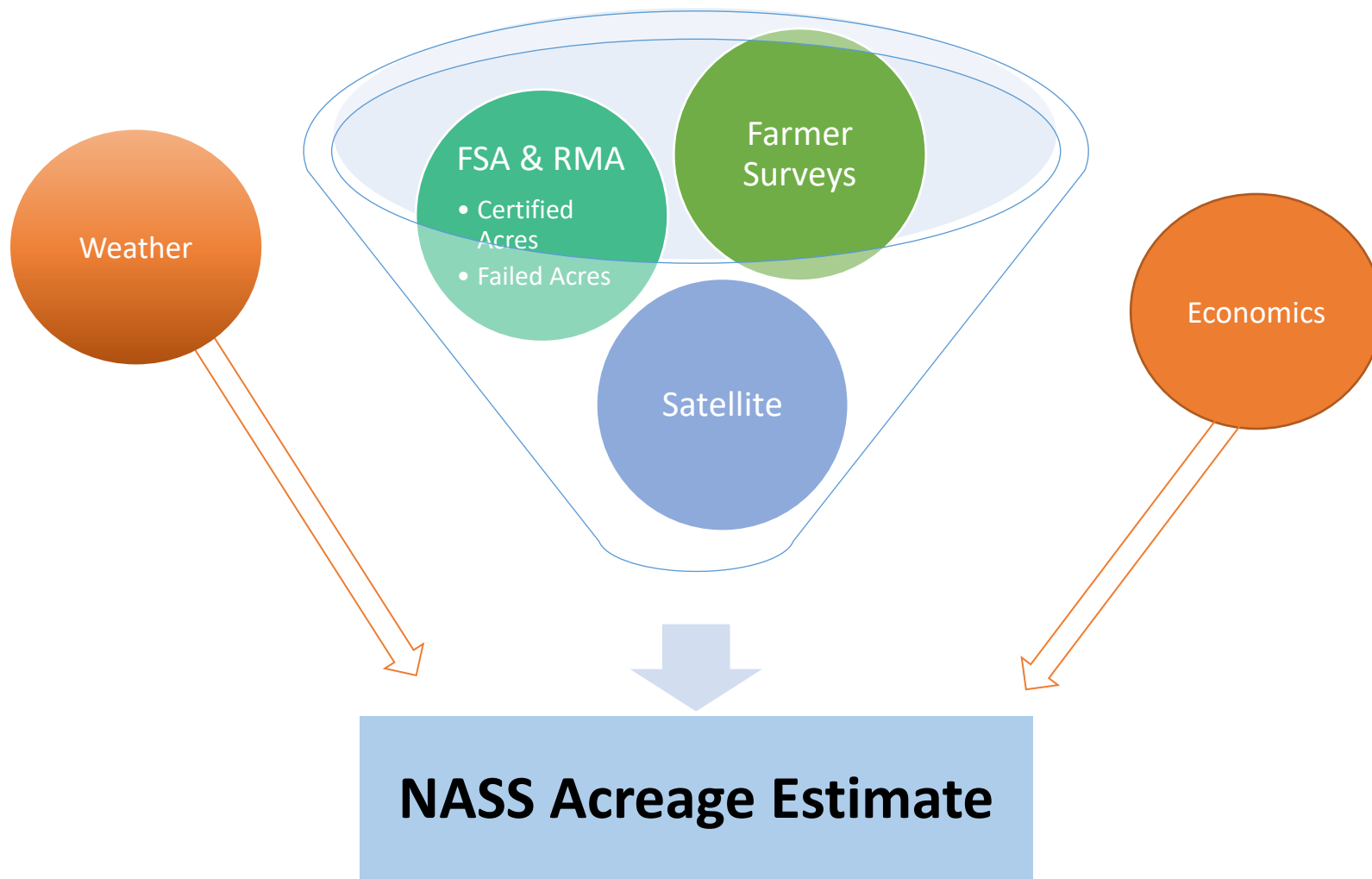
United States Department of Agriculture
National Agricultural Statistics Service

Month	Planted Acres	Harvested Acres	Yield	Production	Ending Stocks
January 2022	--	--	--	--	--
February	--	--	--	--	--
March	NASS 	--	--	--	--
April	NASS 	--	--	--	--
May	NASS 	WAOB	WAOB	WAOB	WAOB
June	NASS 	NASS 	WAOB	WAOB	WAOB
July	NASS 	NASS 	WAOB	WAOB	WAOB
August	NASS 	NASS 	NASS 	NASS 	WAOB
September	NASS 	NASS 	NASS 	NASS 	WAOB
October	NASS 	NASS 	NASS 	NASS 	WAOB
November	NASS 	NASS 	NASS 	NASS 	WAOB
December	NASS 	NASS 	NASS 	NASS 	WAOB
January 2023	NASS 	NASS 	NASS 	NASS 	WAOB
February	NASS 	NASS 	NASS 	NASS 	WAOB
March	NASS 	NASS 	NASS 	NASS 	WAOB
April	NASS 	NASS 	NASS 	NASS 	WAOB
May	NASS 	NASS 	NASS 	NASS 	WAOB
June	NASS 	NASS 	NASS 	NASS 	WAOB
July	NASS 	NASS 	NASS 	NASS 	WAOB
August	NASS 	NASS 	NASS 	NASS 	WAOB
September	NASS 	NASS 	NASS 	NASS 	NASS 
October	NASS 	NASS 	NASS 	NASS 	NASS 

Where WAOB Estimates Come From



Where NASS Estimates Come From



Census vs Annual Program

Census

- All Farms
- Virtually All Items
- Conducted Every 5 Years
- Required by Law

Annual Program

- Sample Surveys
- ~90-95% Crop & State Coverage
- Weekly, Monthly, Annual
- Mostly Voluntary



2022 Census of Agriculture Timeline



June 2022 – Signup Ends

Nov/Dec 2022 – Mail Out

Dec 2022-Jan 2023 – Reminders, Follow-Up Contact

Feb 2023 – Response Deadline

2023 – Data Processing & Analysis

Early 2024 – Data Release



Typical Annual Program Process

Mail Questionnaire & Web Response Instructions

Follow-Up Contact

Telephone (Call Centers)

Personal Enumeration (Limited)

Data Analysis & Estimate Establishment

Report Release



Where NASS Estimates Come From

Farmer
Surveys

Primary Acreage Surveys

March

Agricultural Survey

- ~79,000 Farmers
- ~First 2 Weeks of March

Prospective
Plantings

June

Agricultural Survey
Area Survey

- ~100,000 Farmers
- ~First 2 Weeks of June

Acreage

December

Agricultural Survey

- ~78,000 Farmers
- ~First 2 Weeks of December

Annual
Crop
Production



Where NASS Estimates Come From

FSA & RMA

- Certified Acres
- Failed Acres

Acreage Data from FSA & RMA

FSA

Certified Acres

- August
- October
- Annual

Crop
Production

FSA & RMA

Failed Acres

- Annual

Annual
Crop
Production

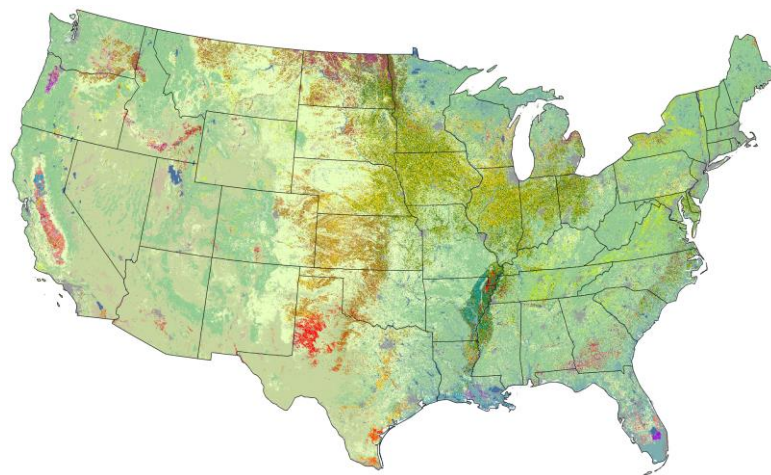
Where NASS Estimates Come From

Satellite

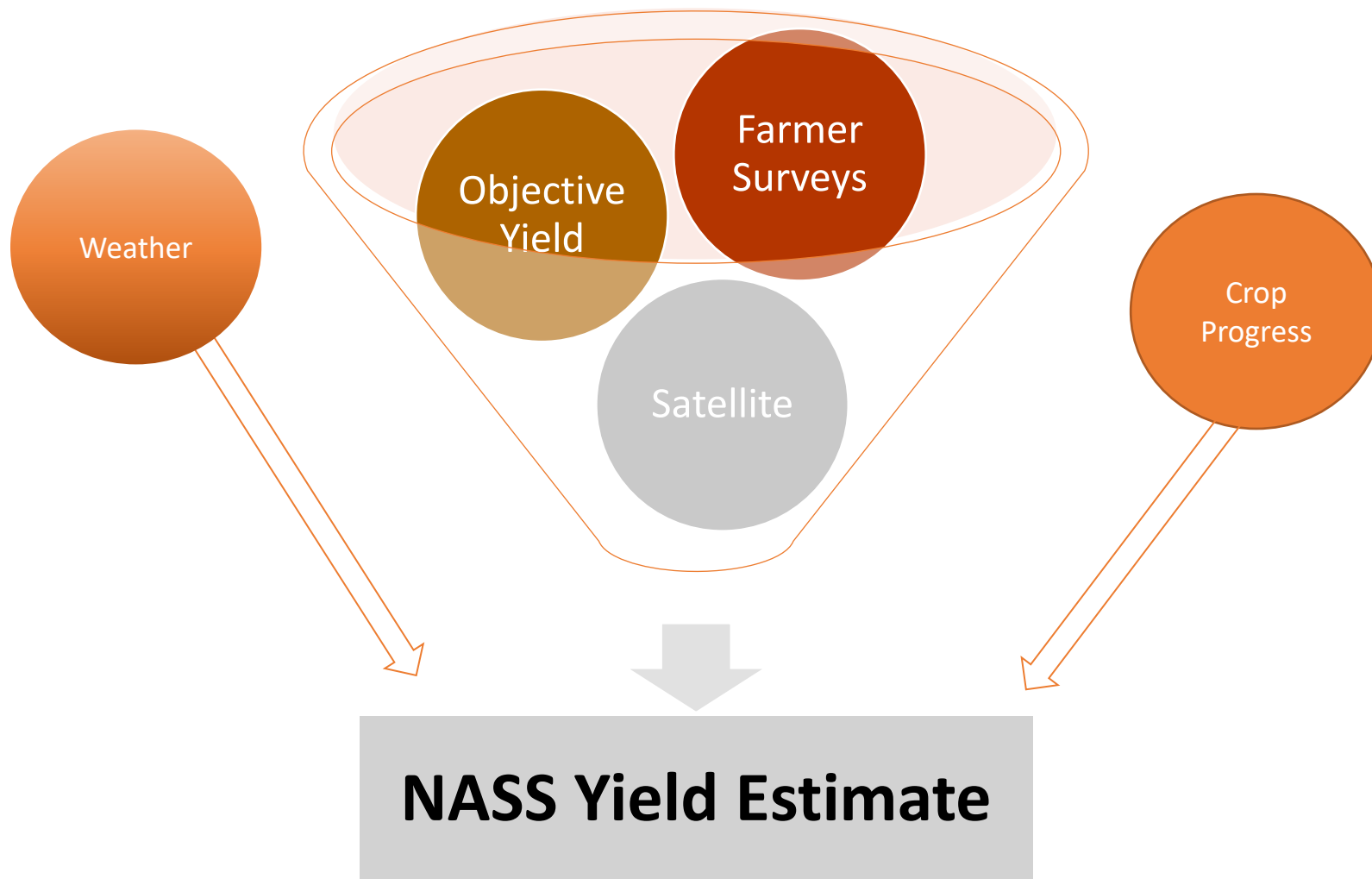
Acreage Data from Satellites

- Annually released, geo-referenced, 30m, **crop-specific** land cover dataset
- Produced with **optical satellite imagery** spanning the growing season
- Leverage **FSA Common Land Unit** for ground reference data
- Provide NASS with **independent acreage estimates**
- Over 100 **cropland categories**
 - Major commodities, double cropping, specialty crops, etc.
- **National** scale since 2008 and 9 billion pixels/year

Cropland Data Layer



Where NASS Estimates Come From





Where NASS Estimates Come From

Farmer
Surveys

Primary Yield Surveys

Objective
Yield

Ag Yield

- August - November
- 8,000 – 21,000 Farmers

Objective Yield

- September - November
- >1,000 Sample Fields

December

Agricultural Survey

- ~78,000 Farmers
- ~First 2 Weeks of December

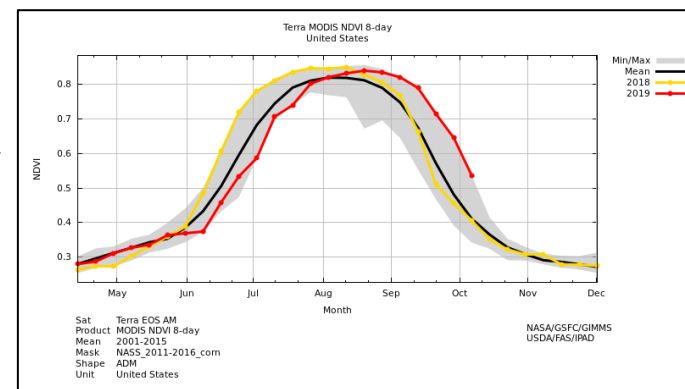
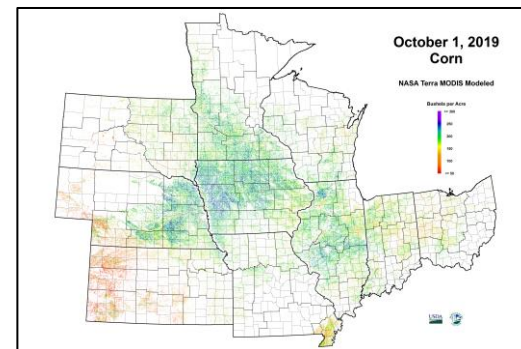
Crop
Production

Annual
Crop
Production

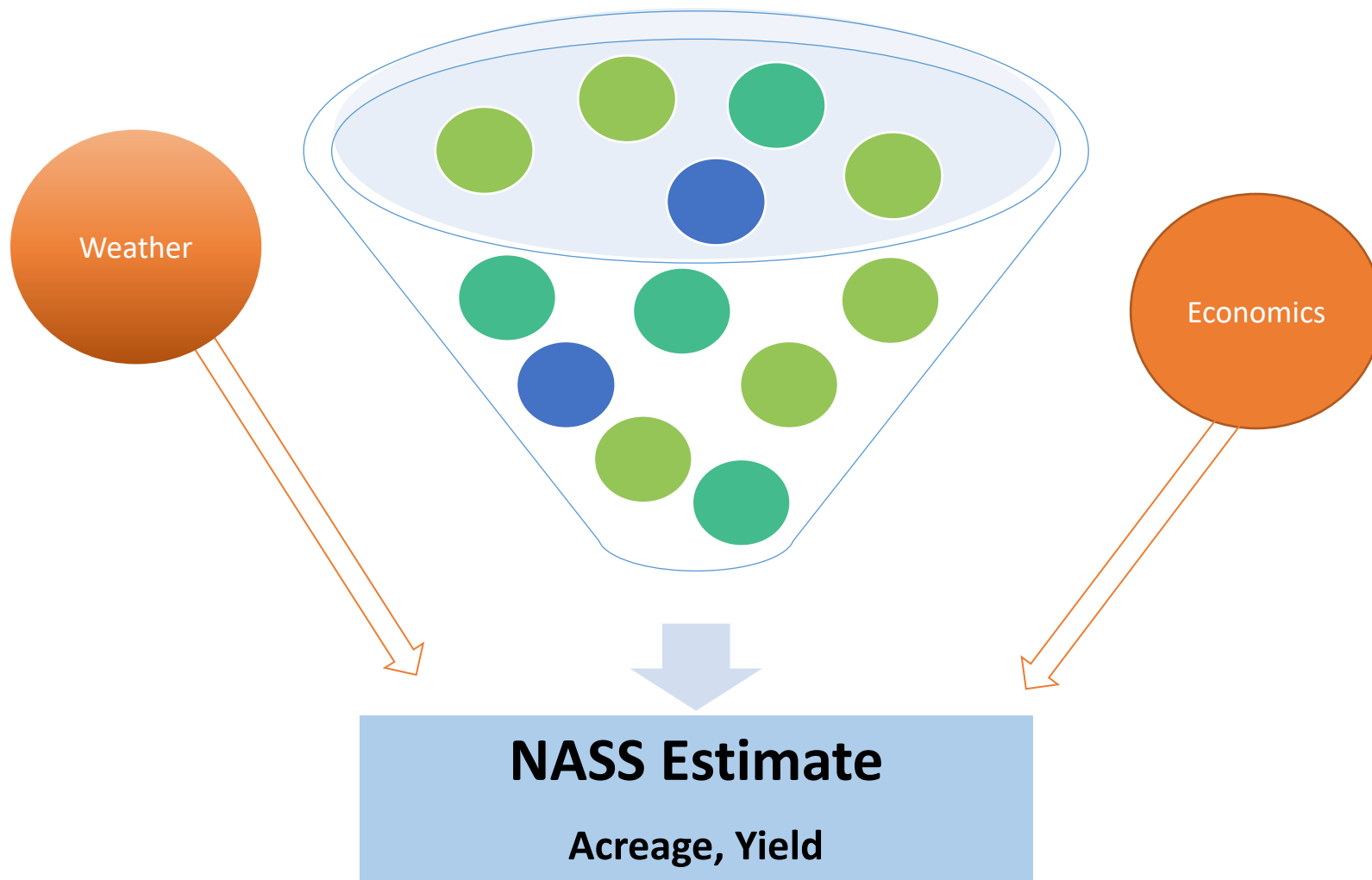
Satellite

Yield Data from Satellites

- Utilize time-series 250m MODIS satellite data to obtain biomass and temperature estimates throughout the growing season
 - Empirically-based prediction model based on historical imagery and NASS county-level yield statistics
 - Integrate crop phenology over growing season
 - Use Cropland Data Layer (CDL) to isolate known crop areas
- Estimate corn and soybean yield over major production states
 - Positive relationship between crop yield and biomass – plant vigor “greenness” – NDVI
 - Negative relationship between crop yield and land surface temperature
- Produce August 1 national and state yield estimates
 - Followed by September 1st, October 1st, and November 1st
 - Independent of NASS Objective and Agricultural Yield surveys
- Must be timely, accurate, and useful
 - Perform within crop season at monthly intervals with little latency
 - Using decision trees (Rulequest Cubist)

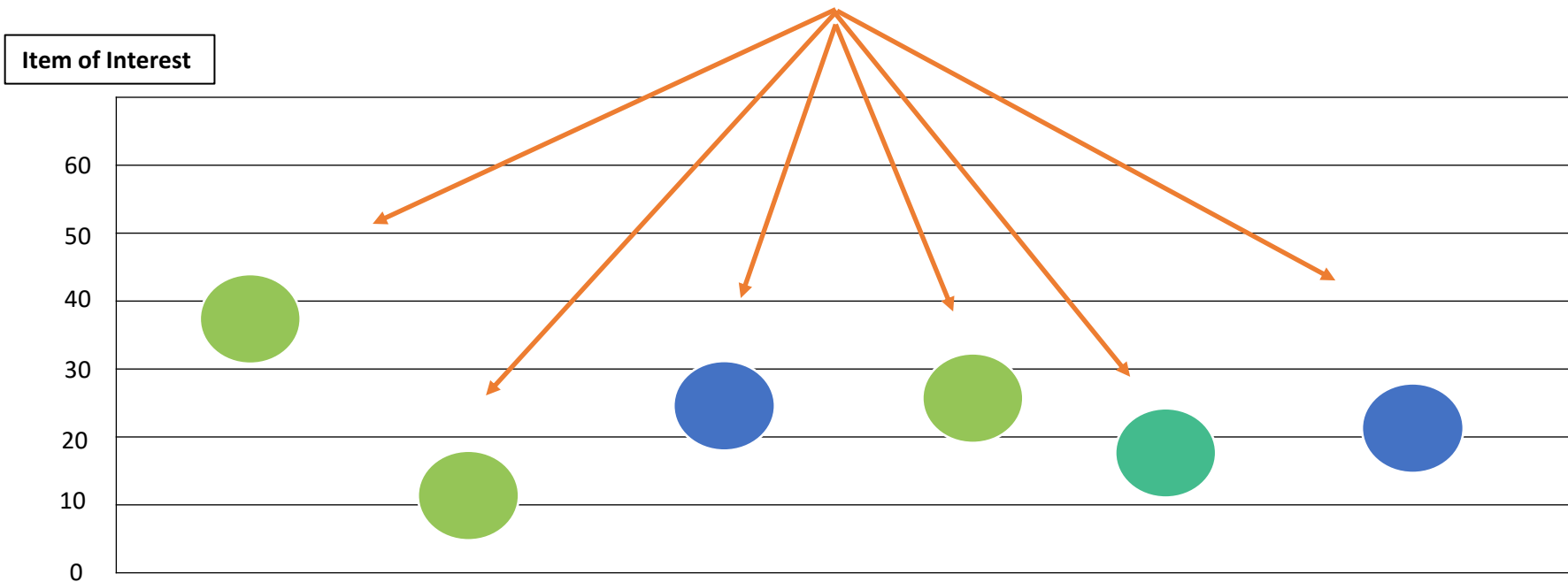


Where NASS Estimates Come From



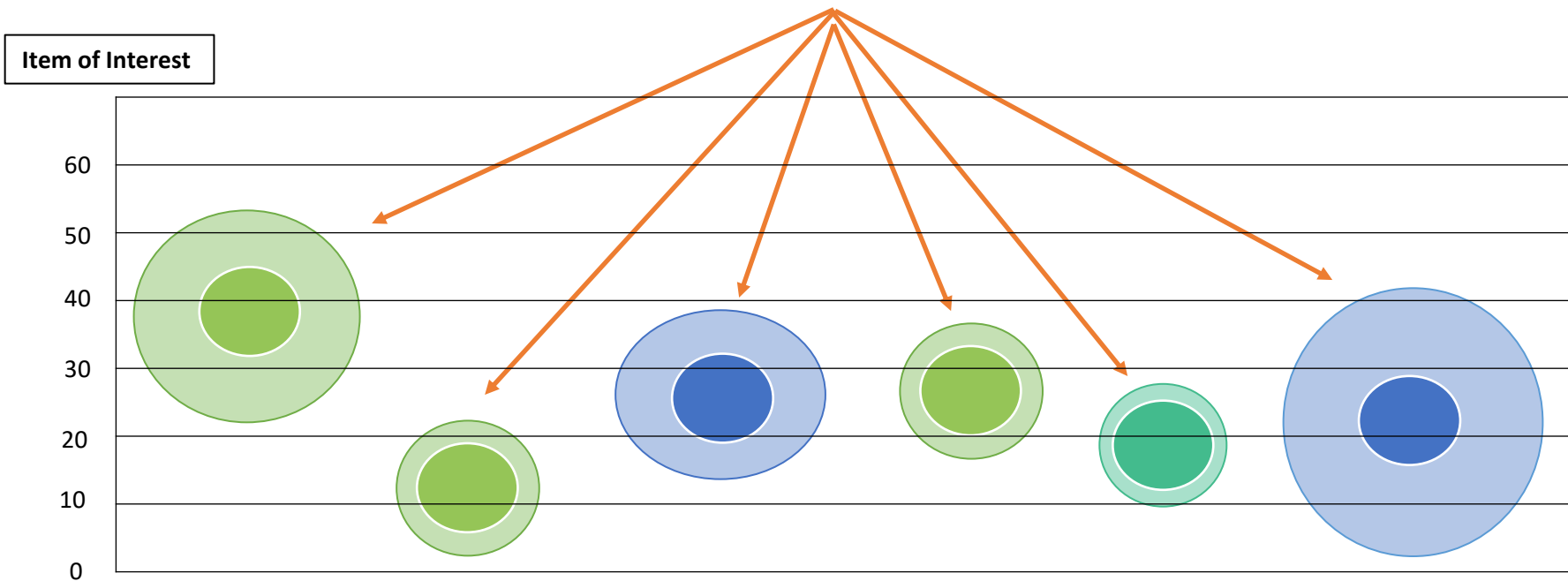
Where NASS Estimates Come From

Multiple Indications For Given Estimate



Where NASS Estimates Come From

Multiple Indications For Given Estimate



Precision/Accuracy
Coefficient of
Variation (CV)

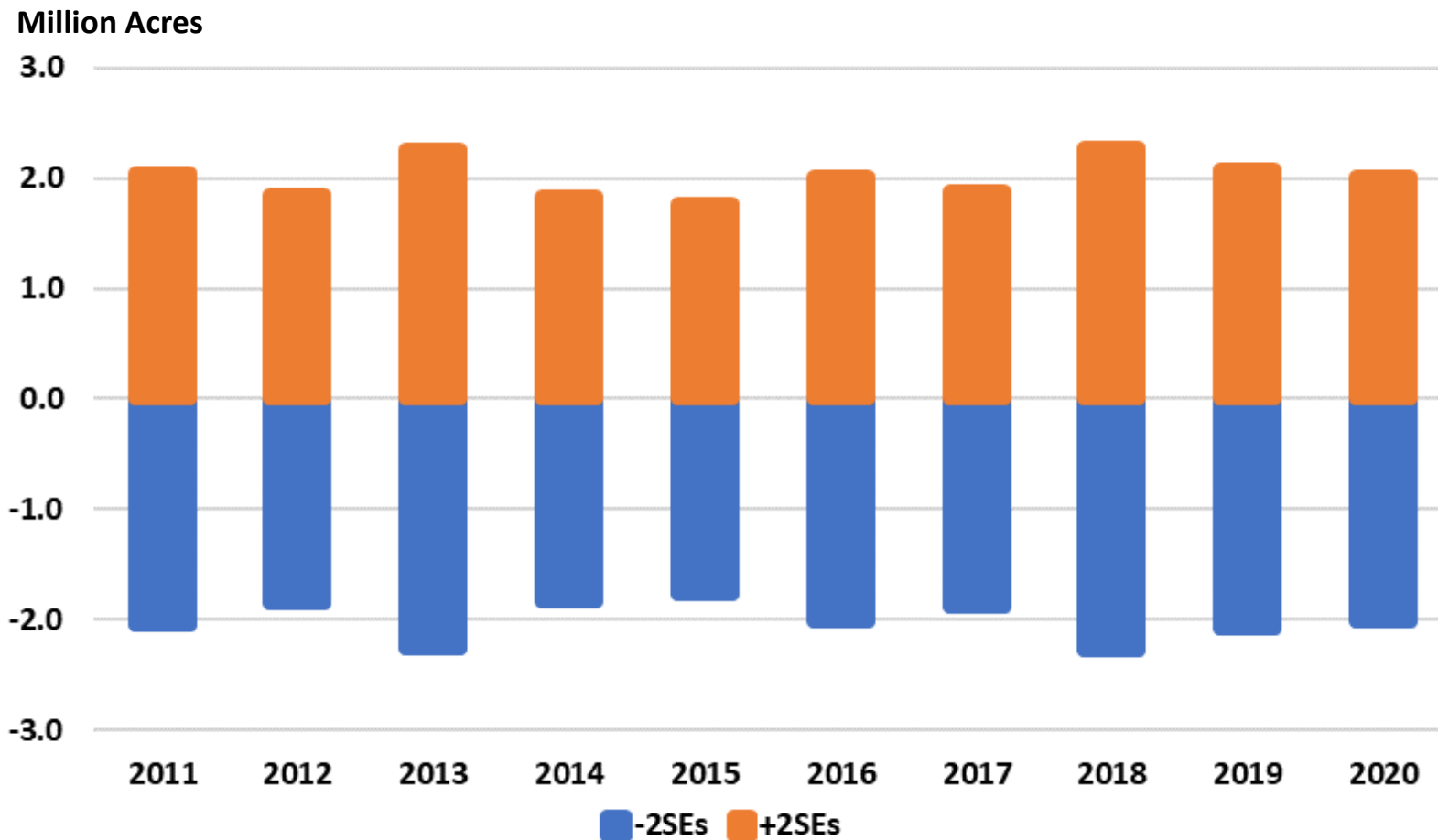


Range Around
Indication



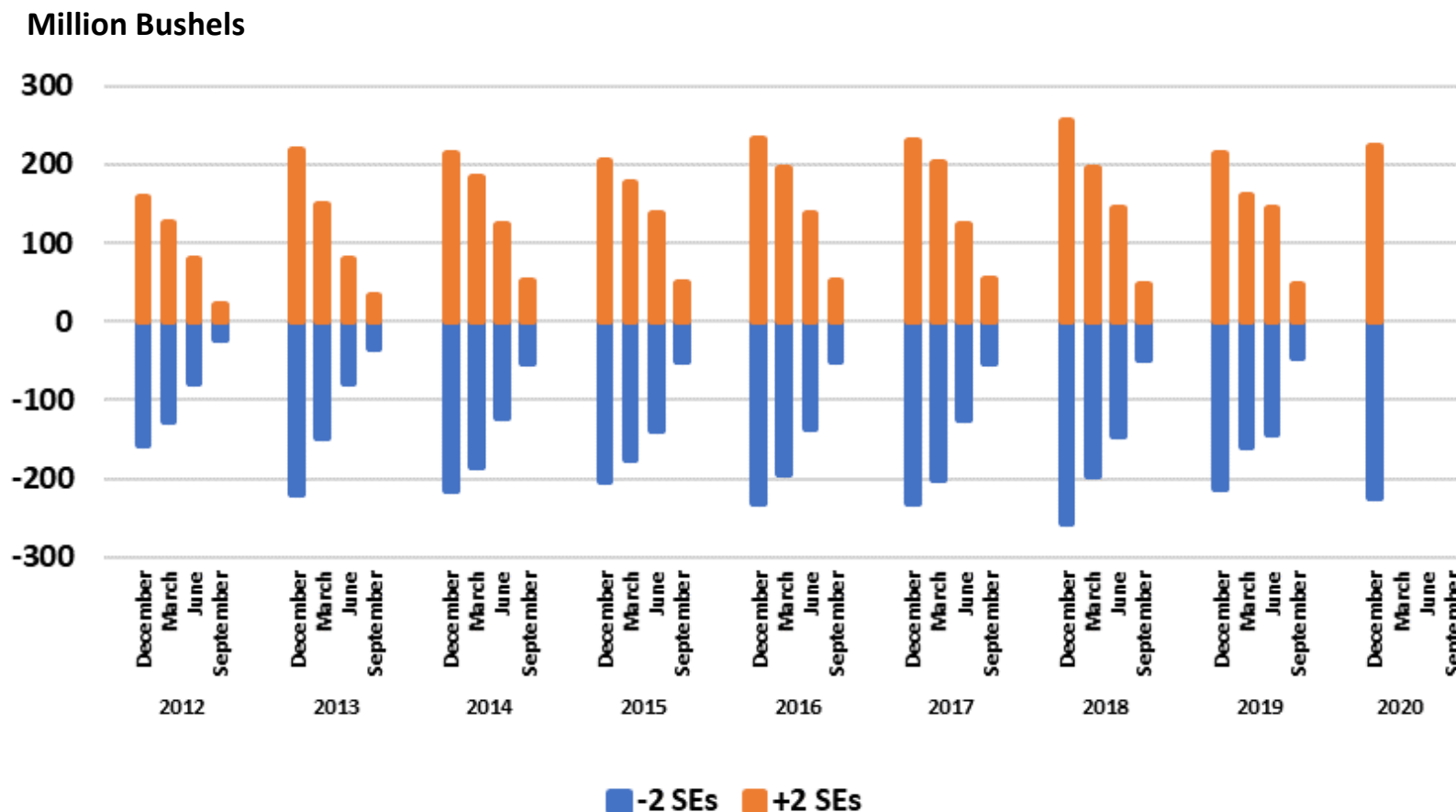
U.S. Corn Planted Acres

Measure of Uncertainty Relative to Estimate



U.S. Corn On-Farm Stocks

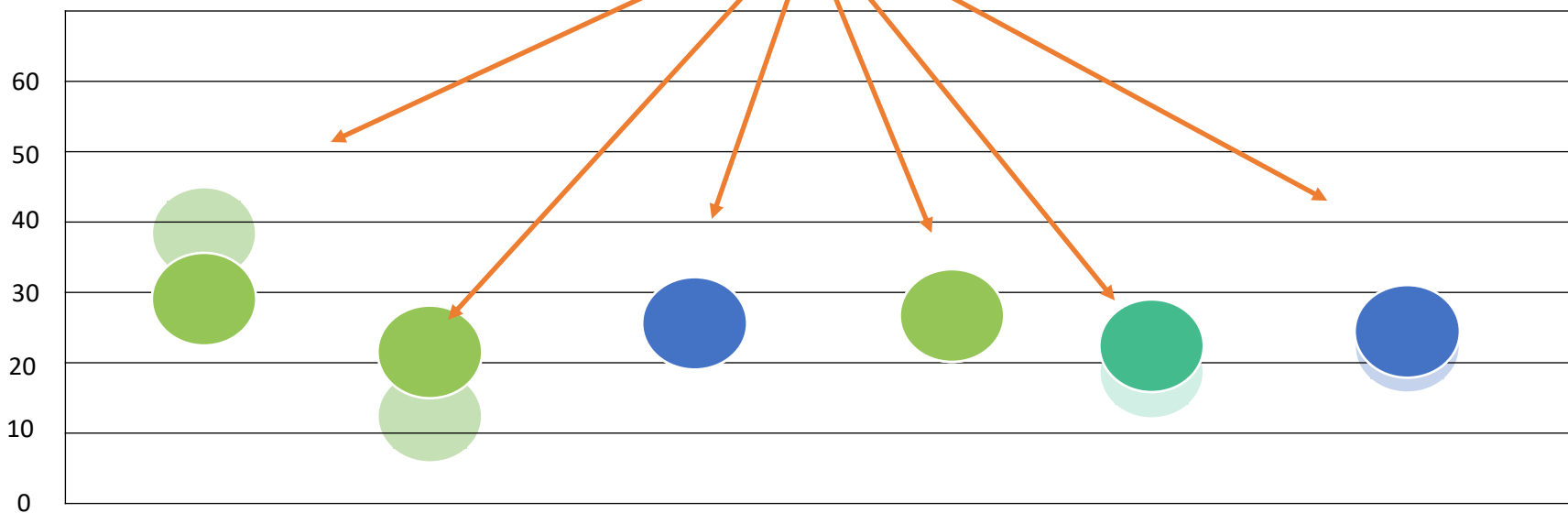
Measure of Uncertainty Relative to Estimate



Where NASS Estimates Come From

Multiple Indications For Given Estimate

Item of Interest



Amount Above
or Below

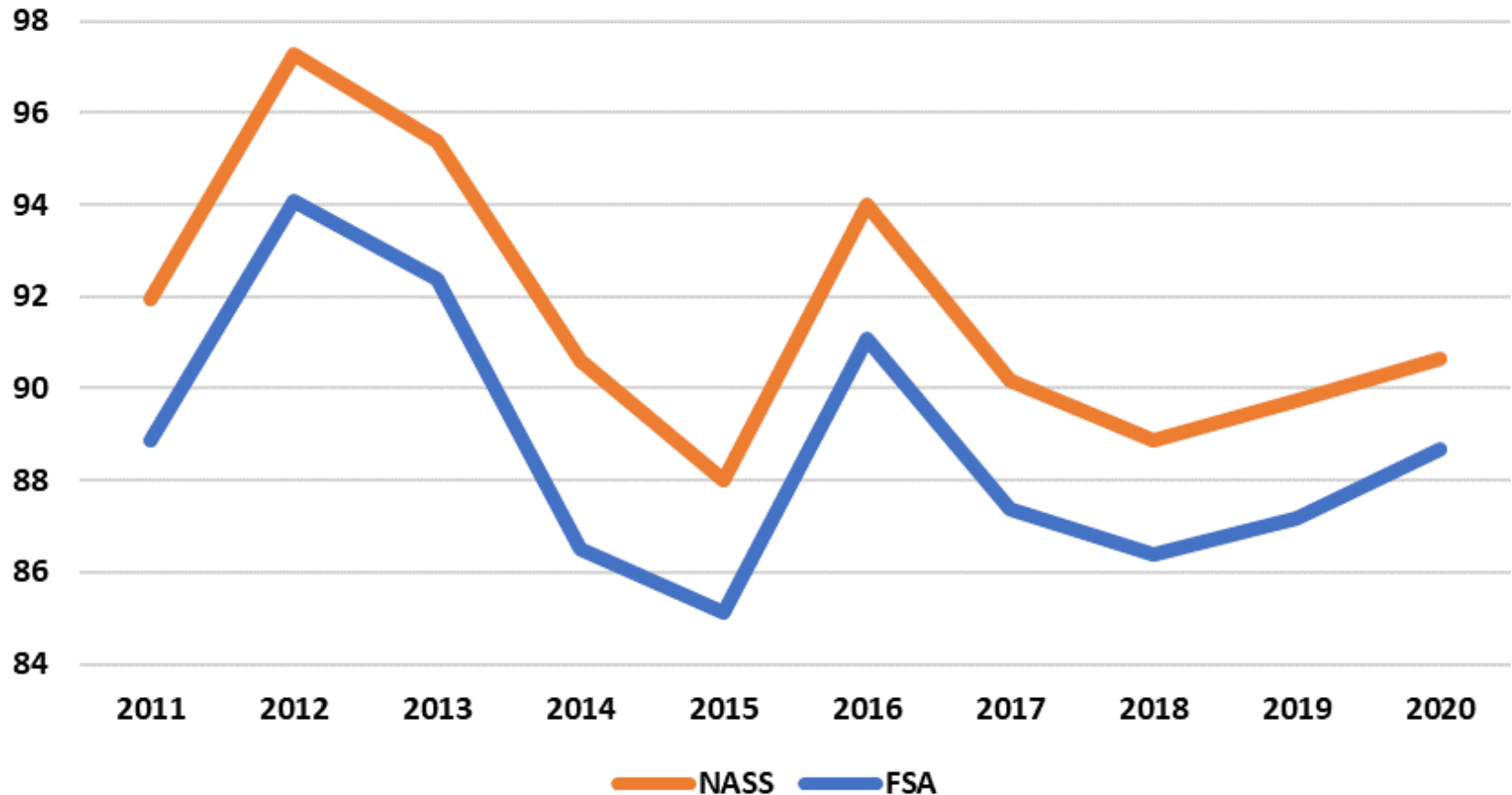
Bias
Historical
Performance



U.S. Corn Planted Acres

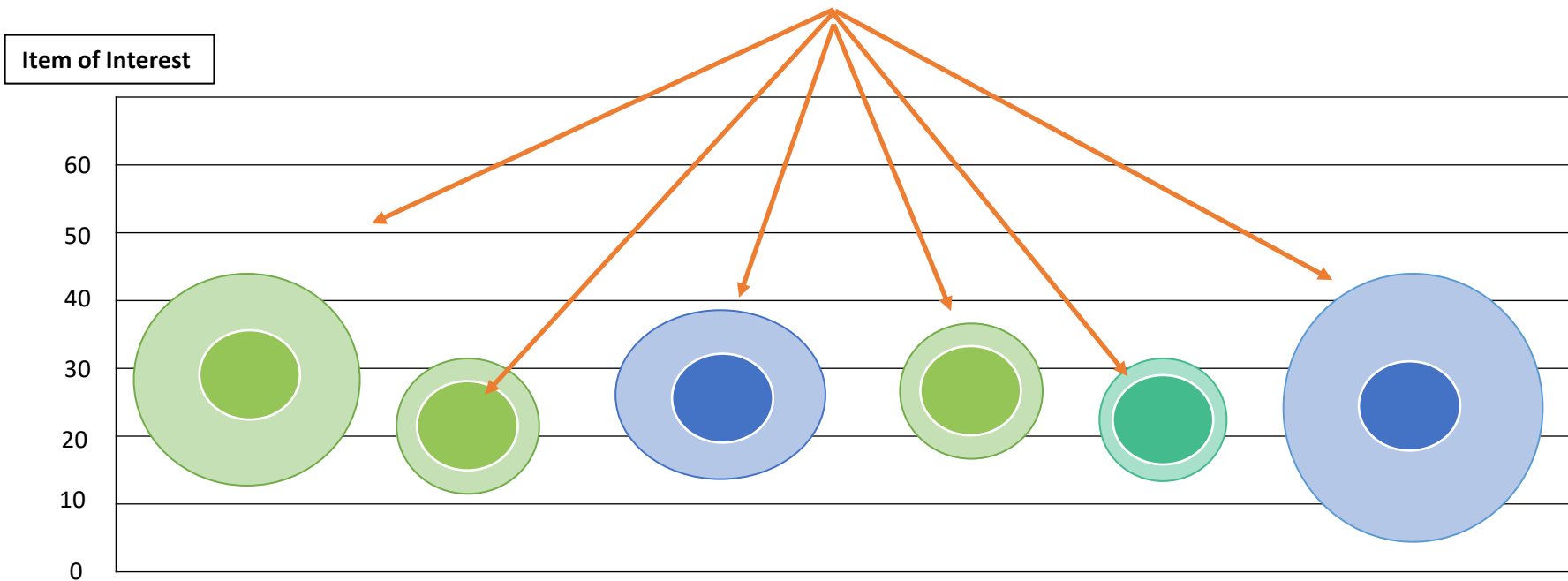
NASS Estimate vs FSA Certified Acres

Million Acres



Where NASS Estimates Come From

Multiple Indications For Given Estimate



Precision/Accuracy
Coefficient of
Variation (CV)



Range Around
Indication

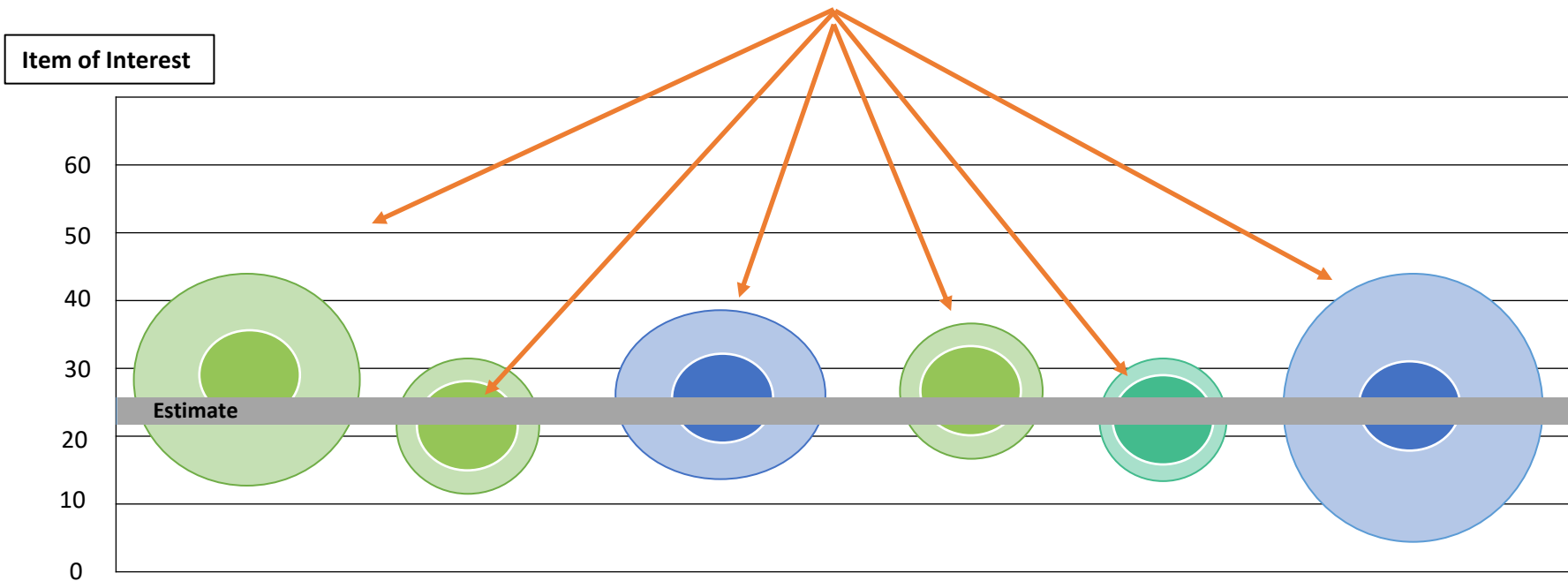


Amount Above
or Below

Bias
Historical
Performance

Where NASS Estimates Come From

Multiple Indications For Given Estimate



Precision/Accuracy
Coefficient of
Variation (CV)



Range Around
Indication



Amount Above
or Below

Bias
Historical
Performance

Certain Requirements Must be Met to Publish

Confidentiality

- Must have at least 3 positive reports.
- No single operation can represent large proportion of total.

Fit for Use

- Data must be sufficient to meet statistical standards.
- Various “Publication Standards” in place across programs.

NASS Confidentiality Pledge

USDA's National Agricultural
Statistics Service protects your
privacy and your data.

It's the law.





Transparency



Methodology and Quality Measure Reports

<https://www.nass.usda.gov/Publications/Methodology and Data Quality/index.php>

- Survey Methodology Discussion
- Sample Size
- Survey Response Rate
- Weighted Item Response Rate
- Coefficient of Variation (CV)



ISSN: 2167-1761

Released September 15, 2021, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, United States Department of Agriculture (USDA).

Scope and Purpose: Estimates of row crops acreage and production are derived from the Agricultural Survey. The Agricultural Survey is a quarterly survey (March, June, September, and December) conducted in all states, except Hawaii, but the estimates that are published in the Annual Crop Production Summary are all collected during the December survey. The Agricultural Survey also collects on farm grain stocks and storage capacity each quarter. Reports received from individual farmers and ranchers remain confidential and are used only in combination with other reports to arrive at State and National estimates.

The use of crop acreage, production, and stocks information is extensive and varied. It helps producers find the best market opportunities for their commodities. Often, recommendations and forecasts presented in agricultural magazines, news releases, etc. are based on data from the Agricultural Survey found in NASS reports. Uses of data by farm organizations, financial institutions, insurance companies, agribusinesses, State and National farm policy makers, and buyers of agricultural products may range from maintaining a basic data series to preparing marketing campaigns and determining needs and rates on farm loans and insurance policies. Government agencies at various levels are important users of statistics. Federal farm programs require information on acreage, production potential, stocks, prices, and income. Agricultural statistics are used to plan and administer Federal and State programs in areas such as consumer protection, conservation, foreign trade, education, and recreation.

Timeline: The reference date for the December Agricultural Survey is the first of the month with a data collection period of approximately 15 calendar days. Regional Field Offices (RFOs) may begin data collection two days prior to the reference date. Data collection continues until a scheduled ending date, and RFOs have about 4 or 5 business days to complete editing and analysis, execute the summary, and interpret the survey results. The Agricultural Statistics Board (ASB) conducts the National review, reconciles State estimates to the National estimates, and prepares the official estimates for release in 5 or 6 business days. The Annual Crop Production Summary is released at the beginning of January. The publication contains annual U.S. data for acreage and production for corn, cotton, hay, soybeans, and other row crops.

Sampling: The target population for the Agricultural Survey is farms with cropland and/or storage capacity. NASS uses a dual frame approach, consisting of list frame and area frame components, to provide complete coverage of this target population.

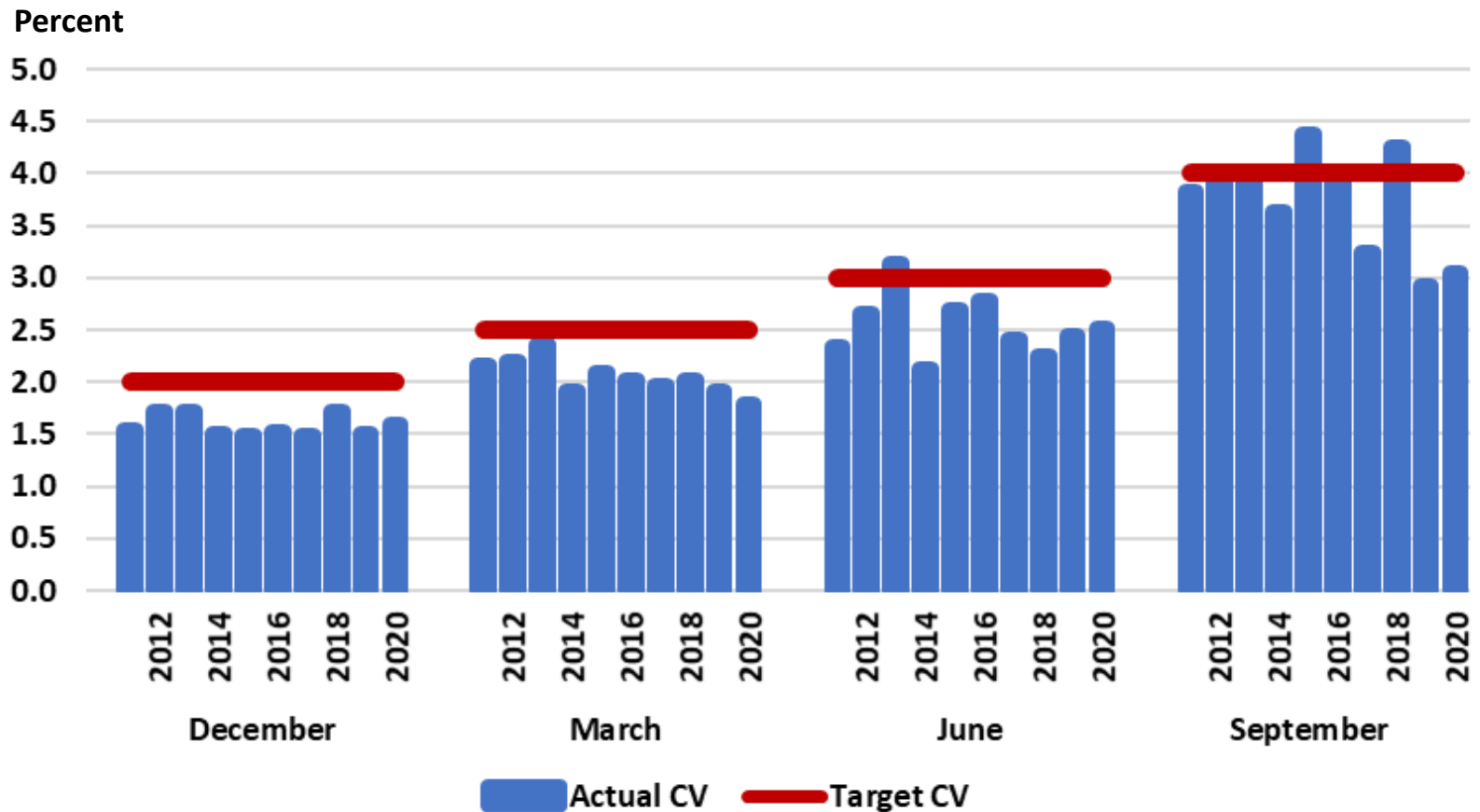
The list frame includes all known farms. Crop acreages, storage capacity, and other agricultural data of each farm are maintained on the list frame to allow NASS to define list frame sampling populations for specific surveys and to employ efficient sampling designs. Only list frame records with positive cropland acres or storage capacity of the desired commodities are included in the list frame population. A lower boundary, such as 50 acres of total cropland or 1,000 bushels of grain storage capacity, is used for some States to establish the list frame sampling population.

The area frame contains all land in the State and, as such, is complete. The land is stratified according to intensity of agriculture using satellite imagery and sampled to effectively measure crops and livestock. All sampled land areas are enumerated in the June Area Survey (JAS). The farms found operating in these segments are checked to see if they are included in the list frame population. The farms that are not included in the list frame sampling population are subsampled for the March, September, and December surveys so that the target population is completely represented. These farms are referred to as the nonoverlap portion of the area frame (NOL). The area frame portion of the Agricultural Survey sample is selected from the NOL using a stratified sample design based on data collected in the JAS. A final sampling weight is assigned to each area frame sampling unit which is used to create the survey estimates.

Transparency

U.S. Corn On-Farm Stocks

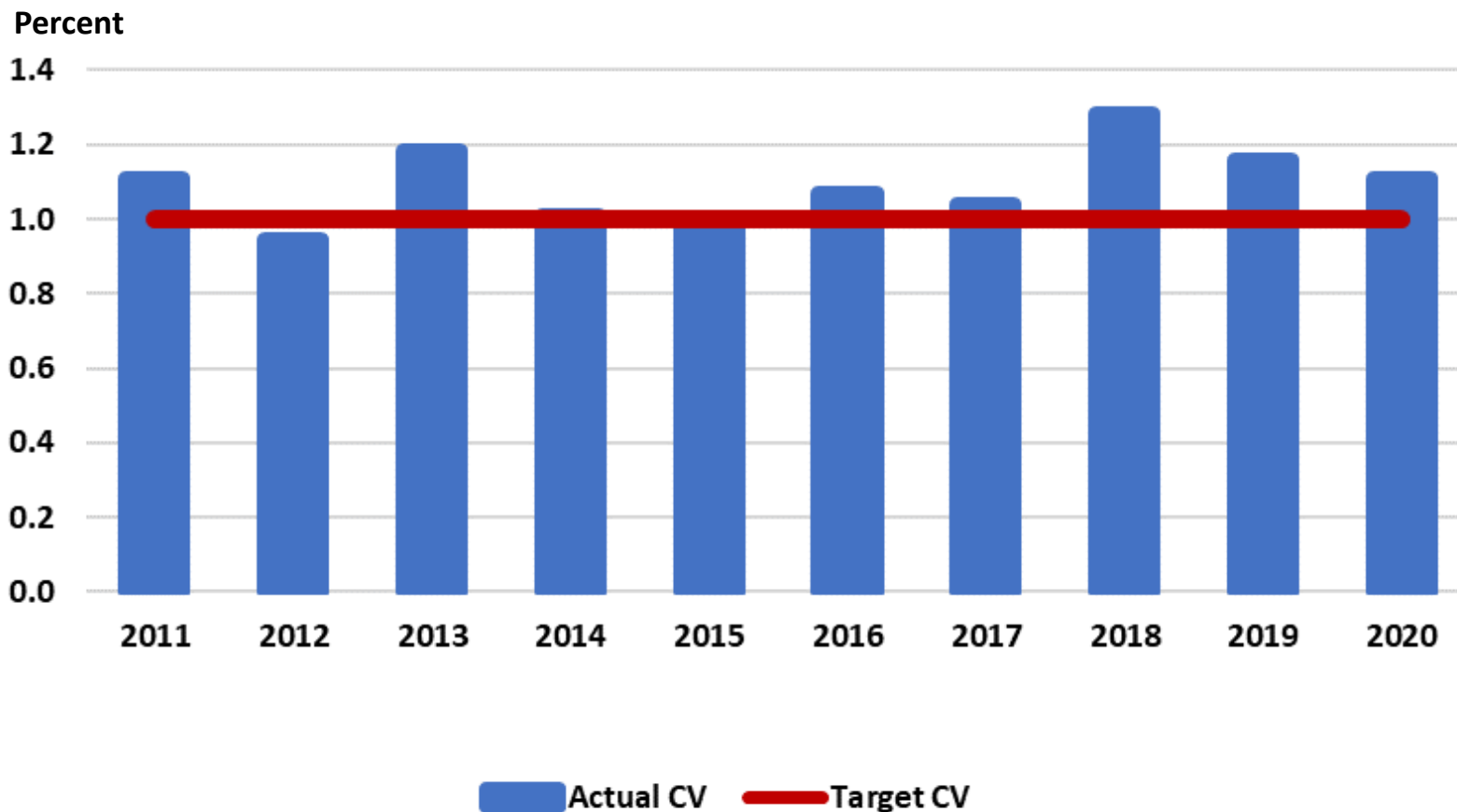
Actual CVs (%) vs Target CVs (%)



Transparency

U.S. Corn Planted Acres

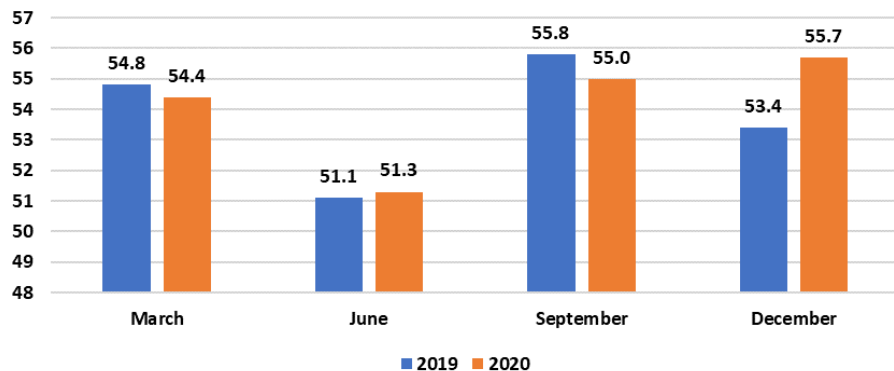
Actual CVs (%) vs Target CVs (%)



Transparency

Response Rates

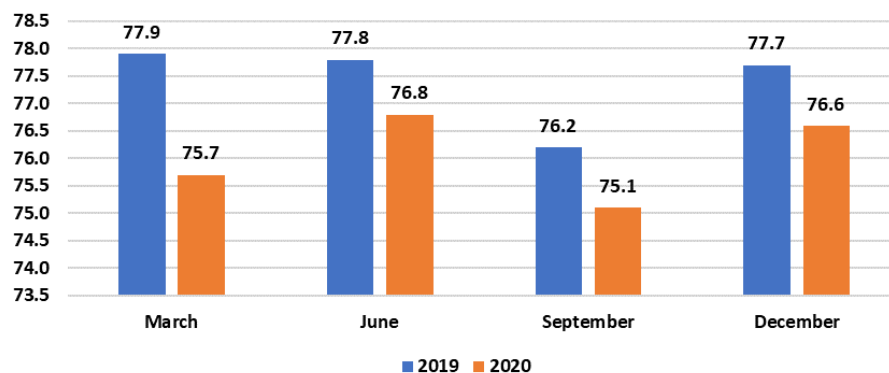
Response Rates
Agricultural Surveys



**Acres, Yield, Production
On-Farm Stocks**

Off-Farm Stocks

Response Rates
Off-Farm Grain Stocks Surveys



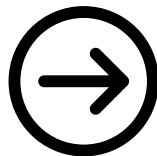
More Data is
Always Better!

Looking Ahead

Grain Stocks

Complete Program Review

- Sampling
- Reporting Form
- Methodology
- Estimating Procedures
- Documentation
- Publication



2021

Review/Assessment

2022

Evaluation/Implementation

Looking Ahead

IMAGES Project

Integrated Modeling and Geospatial Estimation System



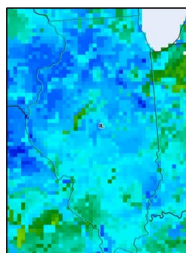
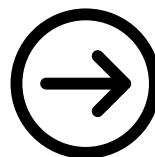
Cropland Data Layers (CDL)



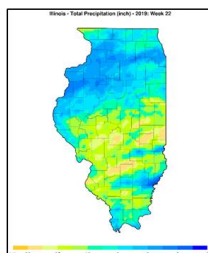
FSA Common Land Unit
and 578 data



Crop Sequence Boundaries
("Fields")



Soil Moisture Data



Precipitation Data



Early Season CDLs

- Utilize a fuller variety of data
- Identify and link more farms to the List Frame
- Operates within USDA's new Enterprise Data Analytics Platform and Toolset (EDAPT) for dynamic high-performance computing



USDA NATIONAL GRAIN & FEED INDUSTRY INSTITUTE

Join @usda_nass on Twitter using #STATChat on Friday, Jan. 10 at 1pm ET to discuss the **Crop Production** and **Grain Stocks** reports with Lance Honig.


STAT CHAT SERIES

FRIDAY, JAN 10 1PM ET

@usda_nass #STATCHAT

Both quick reference and in-depth documentation of procedures.

https://www.nass.usda.gov/Education_and_Outreach/Understanding_Statistics/index.php

 United States
Department of
Agriculture

National
Agricultural
Statistics
Service

Statistical Methods Branch
SHSR Staff Report
Number SHSR 12-01
May 2012

**THE YIELD
FORECASTING
PROGRAM OF
NASS**

The Statistical Methods Branch

#StatChat

**STAT
CHAT
SERIES**

Join NASS Crops Branch Chief Lance Honig on Twitter after the release of major **@usda_nass** crop reports every month for a live Q&A #StatChat. Check **www.nass.usda.gov** for the next scheduled chat.

@usda_nass
#STATCHAT





United States Department of Agriculture
National Agricultural Statistics Service



All Reports Available At

www.nass.usda.gov

Executive Summaries Available At

[www.nass.usda.gov/Newsroom/Executive Briefings](http://www.nass.usda.gov/Newsroom/Executive_Briefings)

Lance Honig

Crops Branch Chief

Lance.Honig@usda.gov

202-577-6558 (cell)

@usda_nass @LanceHonig