

# U.S. Crop Production Forecasting & Estimation Methodology



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# Agenda

- **Field Crops introduction**
- Types of reports
- Surveys used
- Remote Sensing
- Board Process



# Field Crops & Stocks

**173 Crop reports in 2015**

Barley

Beans, Dry Edible

Corn

Cotton/Cottonseed

Flaxseed

Hay

Hops

Lentils

Mint

Rapeseed

Peas, Dry Edible

Rice/Stocks

Rye

Sorghum

Soybeans

Sugarbeets

Sugarcane

Oats

Peanuts

Mustardseed

Tobacco

Wheat

Sunflower

Potatoes

Sweet Potatoes

Canola

Alfalfa Seedings

Proso Millet

Forage

Safflower

Underlined crops have published stock information.





# Annual Estimating Program

- **States included typically account for ~95% of production**
  - May add or remove states from Annual program after Census review
- **“Speculative”**
  - More market sensitive than others
  - Corn, Soybeans, Wheat, Cotton, Oranges
  - Small number of States account for high percent of production and are handled with added security
- **“Non-Speculative”**
  - All other crops & States





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# Field Crops – Acreage and Production

**Agricultural  
Production  
Cycle**



**NASS Survey &  
Estimation  
Cycle**



**When farmers are planning...  
estimate planting intentions.**



**NASS**  
FACT FINDERS FOR AGRICULTURE  
UNITED STATES DEPARTMENT OF AGRICULTURE  
Washington, D.C.

**Prospective  
Plantings**

**After farmers have planted...  
estimate acreage.**



**NASS**  
FACT FINDERS FOR AGRICULTURE  
UNITED STATES DEPARTMENT OF AGRICULTURE  
Washington, D.C.

**Acreage**


**Throughout growing season...  
forecast yield & production.**



**NASS**  
FACT FINDERS FOR AGRICULTURE  
UNITED STATES DEPARTMENT OF AGRICULTURE  
Washington, D.C.

**Crop  
Production**

**At end of season...  
estimate final acreage,  
yield, production.**

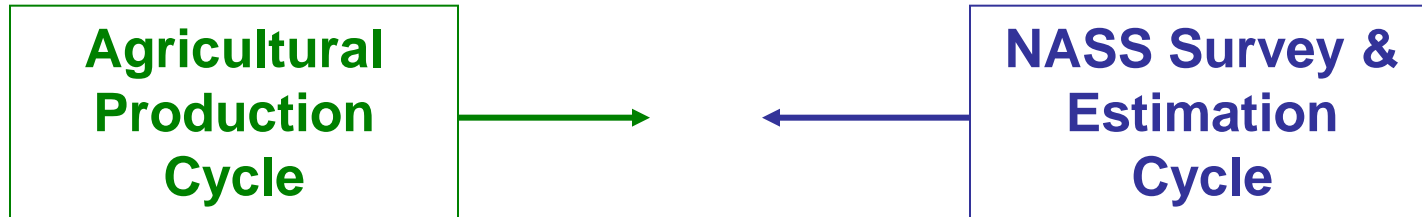


**Crop Production  
2015 Summary  
January 2016**





# Weekly - Crop Progress & Condition



**Throughout growing season...**

**Report crop progress & condition ratings every week.**





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## Surveys Used - Quarterly Surveys

**March, June, September, December**

- **Sampling:**

- **Multi-frame approach (List and Area)**
- **List (MPPS) and Area (Stratified) samples**
- **Have replicated samples from quarter to quarter**
- **List Sample sizes range from approx. 59,000 to 75,000**

- **Collection Methods:**

- **Mail, personal visit, phone, internet reporting**
- **Data comes from farmers**





## Surveys Used - Quarterly Surveys continued

**March, June, September, December**

- **Data collected:**
  - **Planting and Harvested Acreage (intentions and actual) for multiple crops**
  - **On-farm stocks and storage capacity**
  - **Total acres operated, rented acres, owned acres, cropland acres, GMO seed use, etc.**
- **Approximately 1 month from start of data collection to publication**





## Surveys Used – Agricultural Yield

### Monthly during growing season

- **Sampling:** Subsample from Quarterly March, June
  - March subsample for Small grains (MPPS)
  - June subsample for Row crops (MPPS)
- **Data collection methods:**
  - Phone, internet, mail, personal visit
  - Data comes from farmers (subjective)
- **Data collected:** Expected or actual yield, acreage,
- 2 weeks from start of data collection to publication
- Less expensive of the two Yield surveys





## Surveys Used – Objective Yield (OY)

**April – October**

- **National crops: Corn, Soybeans, Wheat, Cotton, Potato**
  - Rice OY until 1993
  - Specific states also do OY for fruit and nut crops
- **Sampling:**
  - Wheat – March multiframe subsample
  - Corn, Soybeans, Cotton- June Area subsample
  - Potatoes – June List subsample
  - Samples sizes range from 1,217 to 1,920





# Surveys Used – Objective Yield (OY)

**April – October**

- **Collection methods:**

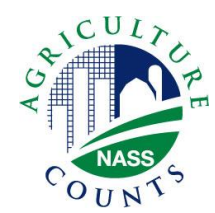
- **Field visits by enumerators**
- **Take counts & measurements**
- **Collect samples and send to lab for analysis**

- **Data collected:**

- **In-season: Crop density, crop maturity, counts**
- **Prior to harvest: Counts and Crop cutting**
- **Lab: moisture content, weight, density, grade**
- **Post-Harvest: Gleanings**

- **2 weeks from beginning of data collection to publication**





## Surveys Used – Crop Progress

### Weekly from April thru November

- **Approximately 4,000 reporters nationally**
  - **Usually Farm Service Agency or Extension agents (expert opinions)**
- **Collection Methods: Most common is internet but can include phone and mail.**
- **This is a very inexpensive and quick survey**
- **5 days from initial request to publication**





## Surveys Used – Crop Progress

### Data Collected includes:

- **Progress of Crop**
  - (ex. Rice: % planted, % emerged, % headed, % harvested)
- **Condition of Crop**
  - (ex. Rice: % very poor, % poor, % fair, % good, % excellent)
- **Topsoil moisture**
  - (% very short, % short, % adequate, % surplus)
- **Subsoil moisture (similar to Topsoil)**
- **Days Suitable for Field work (# of days)**





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- **Remote Sensing**
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## Remote Sensing

- ✓ **Become very reliable for Planted area**
  - ✓ **US has large fields with only 1 crop**
- ✓ **Improving for Yield**
- ✓ **Used for smaller area estimation (later in year)**
  - ✓ **County estimates (separate surveys)**
- **Expensive**
- **Timing issues**
- **Coverage / Weather issues**





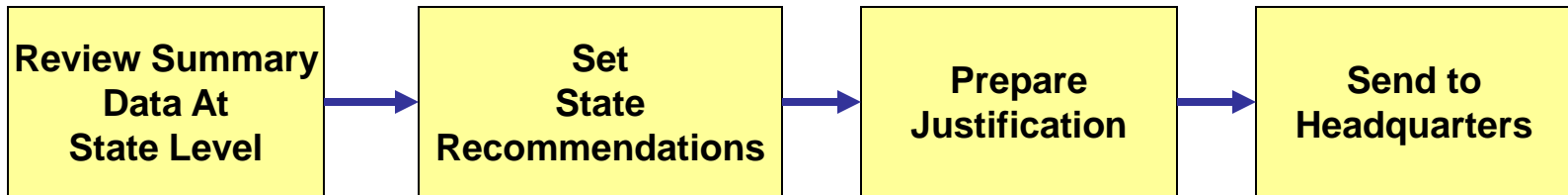
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## Estimation Flow

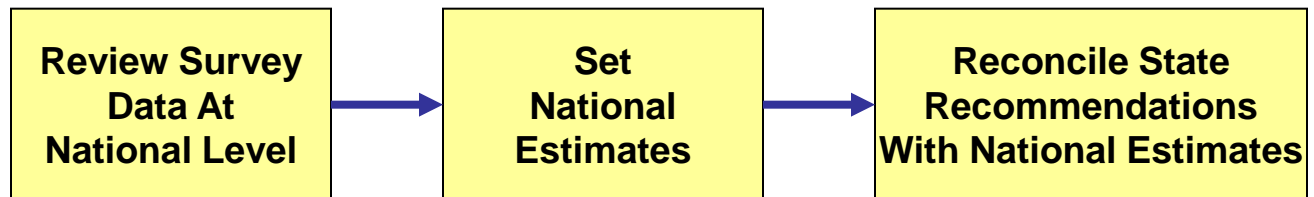
### Field Offices



“mini-boards”, etc.

Comments on weather,  
markets, etc.

### Headquarters





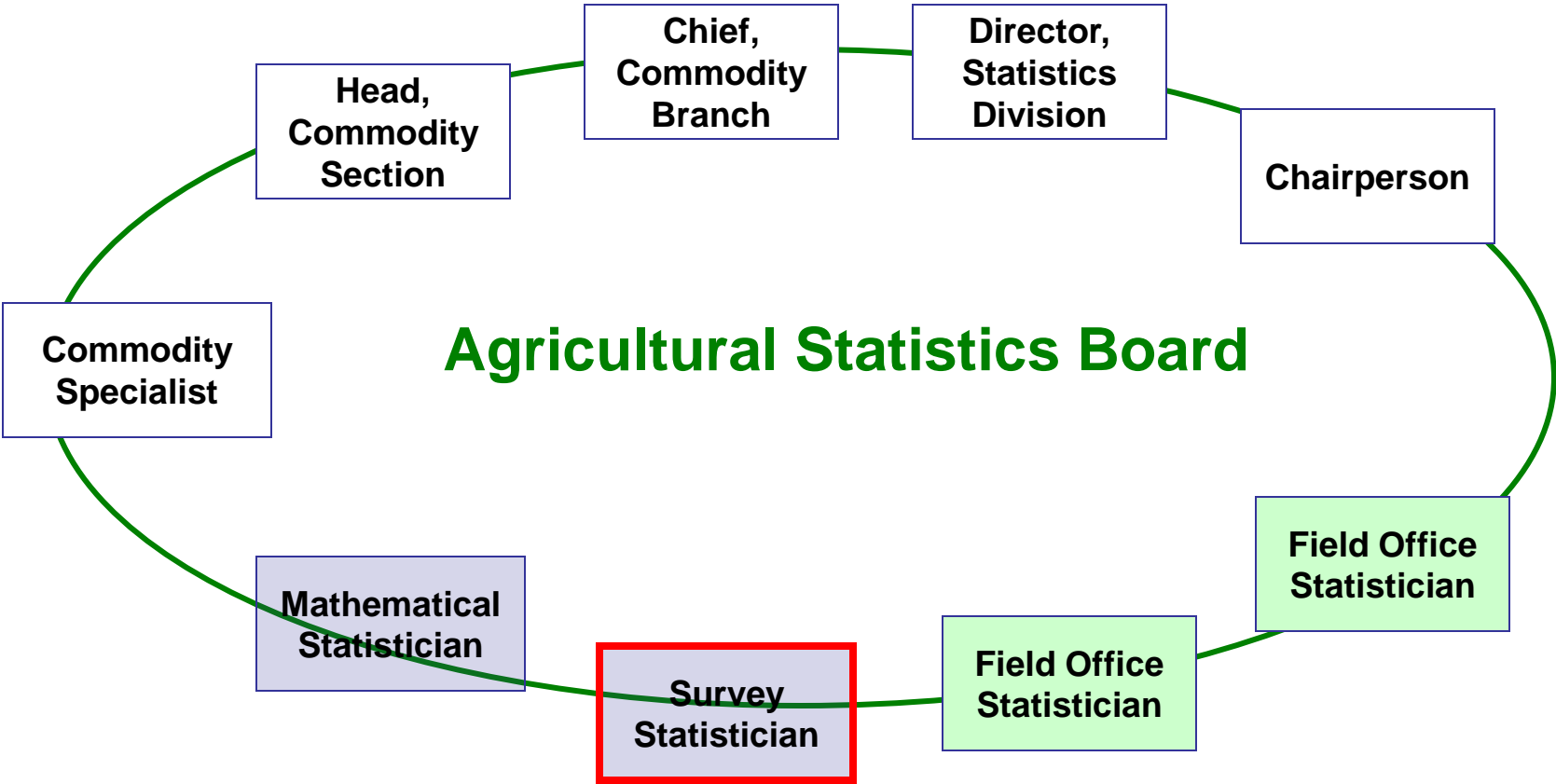
# Agricultural Statistics Board (ASB)

## Headquarters and Lock-up

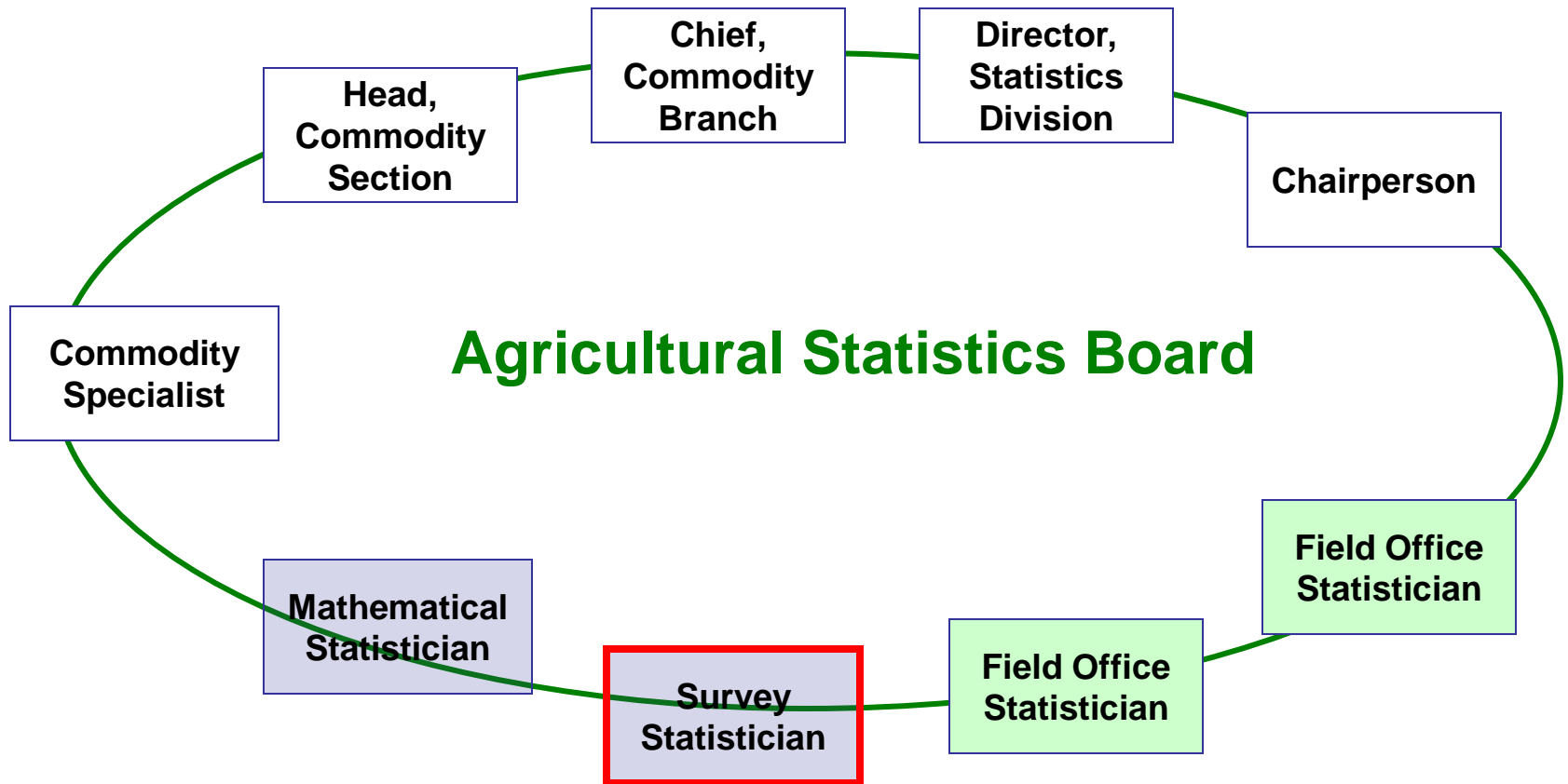
- Security plays a big role when setting estimates for a speculative crop – they get the full ‘Lock-up’ procedures
  - Data is specially encrypted when sent to HQ, and not decrypted until everyone is locked-up.
  - Statisticians are literally locked-up in a set of rooms within USDA – no one leaves until the data is published.
  - No communication with anyone outside the lock-up area is allowed until the data is published.
  - The World Agriculture Outlook Board is also in Lock-up with NASS.



# Who's in the ASB?



Members individually analyze data, comments, State recommendations, etc. and arrive at their own U.S. recommendation



Chair leads discussion until consensus is reached for the U.S. estimate.





## ASB continued

### Once the U.S. number is established ...

- Work begins on reconciling the state recommendations with the national numbers.
- Narratives for publication are written
- Publication report is created and printed.
- 15 minutes before the publication is released, the Secretary of Agriculture (or the Secretary's representative) arrives





## ASB continued

### Once the USDA Secretary arrives ...

- The Secretary signs report BEFORE seeing data, then is briefed on estimates included in report
- The report is released to the public at the designated time and everyone (including the Secretary is then released from lock-up
- **NASS estimates are NON-POLITICAL**







# Agricultural Statistics Board (ASB)

## Non-speculative crop estimates

- For non-speculative crops, it's a similar
  - Still have security – encrypted data and restricted areas (only those working on the reports are allowed in, but the statisticians can come and go as necessary) but not Lock-up
  - Usually fewer people are involved in setting estimates
  - States submit recommendations. HQ sets National estimate, then state numbers.
  - Unlike speculative crops, the states have a chance to discuss the state numbers with HQ.
  - The HQ estimates are the official NASS estimates.



*Thank you*

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