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

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Crop Type</th>
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</thead>
<tbody>
<tr>
<td>Barley</td>
<td>Peas, Dry Edible</td>
<td>Tobacco</td>
</tr>
<tr>
<td>Beans, Dry Edible</td>
<td>Rice/Stocks</td>
<td>Wheat</td>
</tr>
<tr>
<td>Corn</td>
<td>Rye</td>
<td>Sunflower</td>
</tr>
<tr>
<td>Cotton/Cottonseed</td>
<td>Sorghum</td>
<td>Potatoes</td>
</tr>
<tr>
<td>Flaxseed</td>
<td>Soybeans</td>
<td>Sweet Potatoes</td>
</tr>
<tr>
<td>Hay</td>
<td>Sugarbeets</td>
<td>Canola</td>
</tr>
<tr>
<td>Hops</td>
<td>Sugarcane</td>
<td>Alfalfa Seedings</td>
</tr>
<tr>
<td>Lentils</td>
<td>Oats</td>
<td>Proso Millet</td>
</tr>
<tr>
<td>Mint</td>
<td>Peanuts</td>
<td>Forage</td>
</tr>
<tr>
<td>Rapeseed</td>
<td>Mustardseed</td>
<td>Safflower</td>
</tr>
</tbody>
</table>

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 introduction
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Field Crops – Acreage and Production

Agricultural Production Cycle

NASS Survey & Estimation Cycle

When farmers are planning…
estimate planting intentions.

After farmers have planted…
estimate acreage.

Throughout growing season…
forecast yield & production.

At end of season…
estimate final acreage, yield, production.
Weekly - Crop Progress & Condition

Throughout growing season...
Report crop progress & condition ratings every week.

Agricultural Production Cycle

NASS Survey & Estimation Cycle
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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

- 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

1. Review Summary Data At State Level
2. Set State Recommendations
3. Prepare Justification
4. Send to Headquarters

Comments on weather, markets, etc.

“mini-boards”, etc.

Headquarters

5. Review Survey Data At National Level
6. Set National Estimates
7. Reconcile State Recommendations With National Estimates
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?

Agricultural Statistics Board

- Chairperson
- Director, Statistics Division
- Chief, Commodity Branch
- Head, Commodity Section
- Commodity Specialist
- Mathematical Statistician
- Survey Statistician
- Field Office Statistician
- Field Office Statistician
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.
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
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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