Agricultural Monitoring and Crop Estimating

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Conab National Company of Food Supply
Mission

Contribute to regularity of food supply and guarantee income to farmers, participating in the formulation and implementation of agricultural and supply policies
Units Network

- **CONAB - Headquarter**
- **Conab - Regional Offices**
- **Warehouses (storage units) - (2014)**
Objective: Perform periodic monitoring to assess the current stage and condition of crops as a result of recent weather conditions, helping to estimate agricultural yield in the main producing regions.

The results are used to support government agencies in strategy and implementation of public policies and private institutions in the context of agriculture.

Data sources

1 - Field data
2 - Remote sensing
3 - Meteorology

Processing, consolidation, complementarily analysis and diagnosis

Harvest estimation

Editing / formatting

Periodic Reports
www.conab.gov.br
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1- Field data

- Collecting frequency: Monthly
- Geographical unit: state, based on a representative sample of municipalities
- Territorial coverage: most important producing regions
- Data collected: planting areas, yield, agricultural calendar, crops, damage caused by extreme weather events, geo-referenced data, technological packages, others.
- Collection of data: since 1977 (area, yield and production)
- Sources: Cooperatives, rural extension, trades, state and municipality government, direct field observations, others.

<table>
<thead>
<tr>
<th>Summer crops</th>
<th>Winter crops</th>
<th>Permanent crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soy</td>
<td>Wheat</td>
<td>Coffee</td>
</tr>
<tr>
<td>Maize (multi-crops)</td>
<td>Oat</td>
<td>Sugar cane (semi-perennial)</td>
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<tr>
<td>Rice</td>
<td>Rye</td>
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<tr>
<td>Beans (multi-crops)</td>
<td>Barley</td>
<td></td>
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<tr>
<td>Cotton</td>
<td>Rapeseed</td>
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<tr>
<td>Peanut (multi-crops)</td>
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<tr>
<td>Sorghum</td>
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</tbody>
</table>
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1- Field data

77 routes (1 or 2 person/route)
667 municipalities
2,200 questionnaires
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2- Remote sensing

- Imaging frequency: daily, others
- Frequency of monitoring: 16 or 8 days (timings with field data)
- Crop mask: directs monitoring for effective cultivation areas
- Basic informations: Vegetation Indices (VI)
- Geographical unit: mesoregion (municipalities, states, etc.)
- Territorial coverage: main regions (most representative in agricultural production)
- Images: MODIS since 2000, Landsat and other (recent images)
- Sources: GLAM Project, INPE, USGS and others.
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2- Remote sensing

Crop mask

Companhia Nacional de Abastecimento

Histogram (% pixel / VI)

Temporal evolution - complete cycle

VI anomaly

Histogram (% pixel / VI)

Temporal evolution - complete cycle

Current season 10.63% 46.58% 42.79%
Previous harvest 27.7% 51.69% 20.61%
Average (2010-15) 25% 50% 25%
Difference (current season - average) (14.37%) (3.42%) 17.79%

VI Values >> 0 - 0.621 0.621 - 0.8019 0.8019 - 1

Current season 10.63% 46.58% 42.79%
Previous harvest 27.7% 51.69% 20.61%
Average (2010-15) 25% 50% 25%
Difference (current season - average) (14.37%) (3.42%) 17.79%
• Collecting frequency: daily

• Frequency of monitoring: the same timing of the other data sources

• Rainfall: very important climate event for monitoring

• Temperature: relevant in the winter crop monitoring

• Geographical unit: local (weather station), by state and country

• Territorial coverage: National

• Data Collection: since 1960 (partial) - INMET

• Sources: satellites and weather stations (INMET, CPTEC, others)

• Cooperation agreement Conab - INMET in 2015.
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3- Meteorology

Estação: Juti-A749
Código OMNI: 80859
Registro: 12 UTC
Temp. Max.: 22.2 °C
Temp. Min.: 19.3 °C
Umidade: 56%
Página: 397.2 hPa
Precipitação: 3.0 mm
Vento Direção: 52 °
Vento Velocidade: 1.4 m/s

Datas Gráficos

Abertura em: 18/06/2009
Latitude: -22.857216°
Longitude: -54.665834°
Altitude: 375 metros

INMET - Accumulated rainfall per day
Juti(MS) station

INMET - Temperature and humidity
Juti(MS) station - Last 24 hours

INMET - Accumulated precipitation per month
Juti(MS) station
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3- Meteorology

Accumulated rainfall / period

Deviation of monthly rainfall
Ref: climatology (1961-1990)

Soil moisture for ten days

Short-term prognosis

Probabilistic forecast of precipitation / three month
Hydric Cultivation Balance / Relative Productivity and Water Balance Sequence (past 90 days):


**Water deficit (mm) x water excess (mm)**
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Final products

www.conab.gov.br
Argentina (INTA) · Asia Rice Countries (AFSIS, ASEAN+3 & Asia RiCE) · Australia (ABARES & CSIRO) · Brazil (CONAB & INPE) · Canada (AAFC) · China (CAS) · EU (EC JRC MARS) · India (ISRO) · Indonesia (LAPAN & MOA) · International (CIMMYT, FAO, IFPRI & IRRI) · Japan (JAXA) · Mexico (SIAP) · Russia (IKI) · South Africa (ARC & GeoTerralmage & SANSA) · Thailand (GISTDA & OAE) · Ukraine (NASU-NSAU & UHMC) · USA (NASA, UMD, USGS - FEWS NET & USDA (FAS & NASS)) · Vietnam (VAST STI & VIMHE-MARD)
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GLAM Customization to Brazil

http://pekko.geog.umd.edu/glam/brazil/zoom2.php
The GLOBCAST project aims to expand the results of MARS (Monitoring Agricultural Resources) related to estimates agricultural productivity system MCYFS (MARS Crop Yield Forecasting System) for other important agricultural regions of world.

Collaboration agreement between the European Community and CONAB, 2009 – 2014
Support the partnership between Conab and JRC to future development of a Brazilian system based on agro-meteorological models.

Support for EU-Brazil Sectorial Dialogues
Definition of the Project: *Innovation the Conab Crop Monitoring Process.*
New Cooperation Agreement between Conab and JRC to understanding scientific issues in field of crop monitoring and yield forecasting.
Thanks to all who have participated!
Thank you!

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