

Nick Murray - Data Product Design at Gro Intelligence

The following screenshots showcase my work at Salesforce from 2019-2021. For any questions or other materials, please don't hesitate to contact me directly:

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<http://nickm.io>

About [Gro Intelligence](#)

Gro Intelligence empowers customers to make data driven decisions around responding to climate change impacts, and raising the efficiency of agricultural supply chains to support the activities of farmers and their customers. Gro's users also include sovereign governments and multinational donors, who employ Gro's analytics to promote and maintain food security among vulnerable populations.

My role has been to lead the design process behind both our paid analytics tools, and our public facing data products, screenshots below. For more details on select work, please refer to the "Case Studies" section of [my portfolio](#).

Food Security Tracker - Directing Donor Support for Promoting Food Security

Purpose: Supply chain imbalances, and the war in Ukraine have resulted in a spike in global food prices, putting enhanced pressure on food importers in Africa, many of whom were already struggling to maintain food security. Our public facing [Food Security Tracker](#) highlights nations most at risk, and provides the detail necessary for donors to effectively target their support efforts.

Launched: April 2022

Client: [The Rockefeller Foundation](#)

Public URL: <https://community.gro-intelligence.com/food-security-tracker-africa>

Tracking Food Security Across Africa

SUPPORTED BY


Environmental, economic, and political shocks are driving rising food prices and limiting access to major crop staples.

Leveraging both the domain expertise of the Gro team and the most comprehensive, up-to-date data on the African continent, this interactive tool provides estimates on supply and demand for four major crops in Africa: wheat, rice, corn, and soybeans. It also shows the relative impact on food security by country.

[Explore 49 African Countries →](#)

Stocks-To-Use Ratio ⓘ

Gro Drought Index (GDI) ⓘ

A country's reserves of a specific crop is an indicator of food security. A stocks-to-use ratio shows the relationship between stocks and usage. Lower stocks-to-use ratios indicate higher food insecurity.

Gro's Stocks-to-Use Ratio below shows the stocks-to-use across four major crops for countries in Africa. The darker colors indicate countries that are facing tighter supplies and higher risks of food insecurity. Where applicable, the calculation uses Gro's production forecast in place of the USDA's. Last updated May 3, 2022.

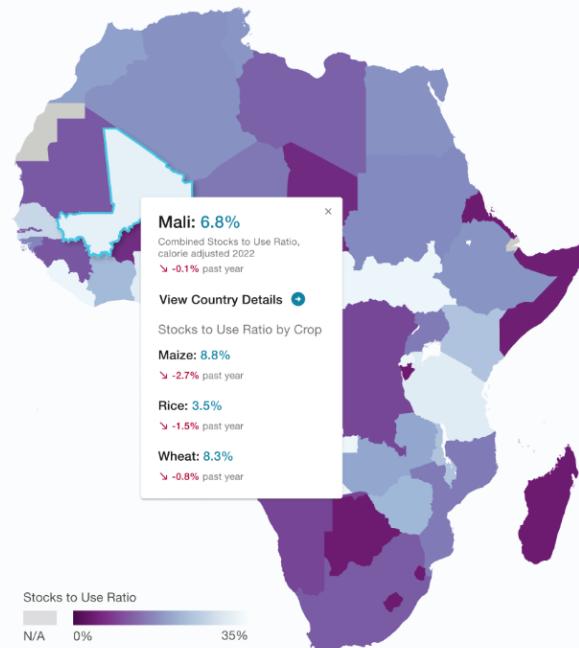
Click any country for details.

COUNTRIES WITH LOWEST STOCKS TO USE RATIO - COMBINED ACROSS CROPS ⓘ

Madagascar
 Zimbabwe
 Chad
 Benin
 Gambia

COUNTRIES WITH FASTEST FALLING STOCKS TO USE RATIO - COMBINED ACROSS CROPS ⓘ

Zimbabwe
 Zambia
 Ghana
 Angola
 Gambia



In the News

Impact Of Russia-Ukraine Conflict On Global Ag ⓘ

Feb 24, 2022

Given the two countries' importance to export markets, and the relationship between energy and ag prices, the conflict will impact agriculture and food supplies across the globe.

North Africa Wheat Imports Could Jump As Region Battles Drought ⓘ

Jan 18, 2022

An increased reliance on imports could potentially strain national budgets and further fuel food price inflation.

Tracking Food Security Across Africa

SUPPORTED BY
The ROCKEFELLER FOUNDATION

Environmental, economic, and political shocks are driving rising food prices and limiting access to major crop staples.

Leveraging both the domain expertise of the Gro team and the most comprehensive, up-to-date data on the African continent, this interactive tool provides estimates on supply and demand for four major crops in Africa: wheat, rice, corn, and soybeans. It also shows the relative impact on food security by country.

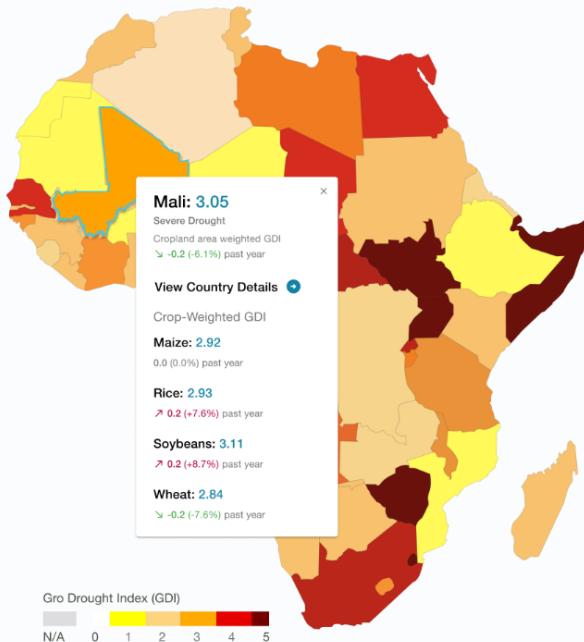
[Explore 49 African Countries →](#)

Stock-to-Use Ratio ⓘ

Gro Drought Index (GDI) ⓘ

The Gro Drought Index below shows weekly-updating drought conditions throughout Africa at the country level. Darker colors represent countries facing higher levels of drought, one of the leading indicators of reduced local production and an early warning of food insecurity. The values are weighted by cropland at the district level for each country. [Last updated May 3, 2022](#).

Click any country for details.



COUNTRIES WITH HIGHEST GRO DROUGHT INDEX ⓘ

Somalia
Mauritania
Mali
Morocco
Niger

COUNTRIES WITH FASTEST RISING GRO DROUGHT INDEX ⓘ

Kenya
Uganda
Tanzania
Somalia
Morocco

In the News

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Back

Country / Region

Mali

Commodity

Rice

Data source: Gro Intelligence

Last updated: Apr 26, 2022

Mali - Rice Supply & Demand Overview

[Download Dataset \(.xlsx\)](#)

STOCKS TO USE - RICE

3.47%

↘ -1.5% past year

RICE PRICE / TONNE

347 \$USD/tonne

↘ -64.13 (-15.6%) past year

GRO PROD. FORECAST, 2022

2,235 thousand tonnes

↗ +198 (+9.7%) past year

GRO DROUGHT INDEX

2.93 (extreme drought)

↗ +0.21 (+7.6%) past year

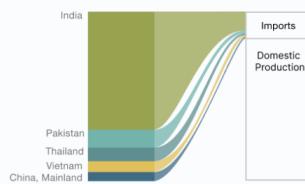
VEG. HEALTH INDEX (NDVI)

0.21

↘ -0.01 (-6.7%) past year

Import/Export Summary - Rice

Imports From



Source: Gro Intelligence, Comtrade. Last Updated: Apr 26, 2022

Balance Sheet - Supply & Demand - Rice

Elements

10 Year Average

2019/20

2020/21

2021/22

forecast

Thousand tonnes

Gro Production Estimate

--

2,037

2,235

Supply

Thousand tonnes

Beginning Stocks

184

284

261 (-8.1%)

120 (-54.0%)

Production

1,693

2,077

1,959 (-5.6%)

1,658 (-15.4%)

Imports

252

300

300 (0%)

550 (+83.3%)

Total Supply

2,129

2,661

2,520 (-5.3%)

2,328 (-7.6%)

Demand

Thousand tonnes

Export Volume

0

0

0

0

Domestic Consumption

1,950

2,400

2,400 (0%)

2,250 (-6.2%)

Total Use

1,950

2,400

2,400 (0%)

2,250 (-6.3%)

Ending Stocks

179

261

120 (-54.0%)

78 (-35.0%)

Stocks to Use Ratio

9.58%

10.9%

5.0% (-5.9%)

3.5% (-1.5%)

Source: Gro Intelligence, USDA PS&D. Last Updated: Apr 28, 2022

Production & Utilization to Date - Rice

Production Domestic Utilization Stocks to Use Ratio (right axis)



Source: Gro Intelligence, USDA PS&D. Last Updated: Apr 28, 2022



Global Fertilizer Impact Monitor - Communicating the Food Security Impact of Fertilizer Shortages

Purpose: Exacerbated by the conflict in Ukraine, a global fertilizer shortage has brought a spike in fertilizer prices. This has significant implications for food security, as it affects the volume of staple crops farmers are able to produce, especially in low income countries.

The [Global Fertilizer Impact Monitor](#) summarizes this impact in calories, putting a spotlight on how integral fertilizer markets are to food security worldwide. Like the [Food Security Tracker](#), this public-facing website aims to direct the efforts of multinational donors in their approach to combating food insecurity.

Launched: June 2022

Client: [The Bill & Melinda Gates Foundation](#)

Public URL: <https://community.gro-intelligence.com/global-fertilizer-impact-monitor/>

Tracking the Impact of Fertilizer Shortage on Global Food Security

Unprecedented supply and demand shocks are causing significant fertilizer shortages and soaring prices worldwide. With this scenario explorer tool, see the impact of changing fertilizer availability scenarios on global food production, and the resulting risks to food security.

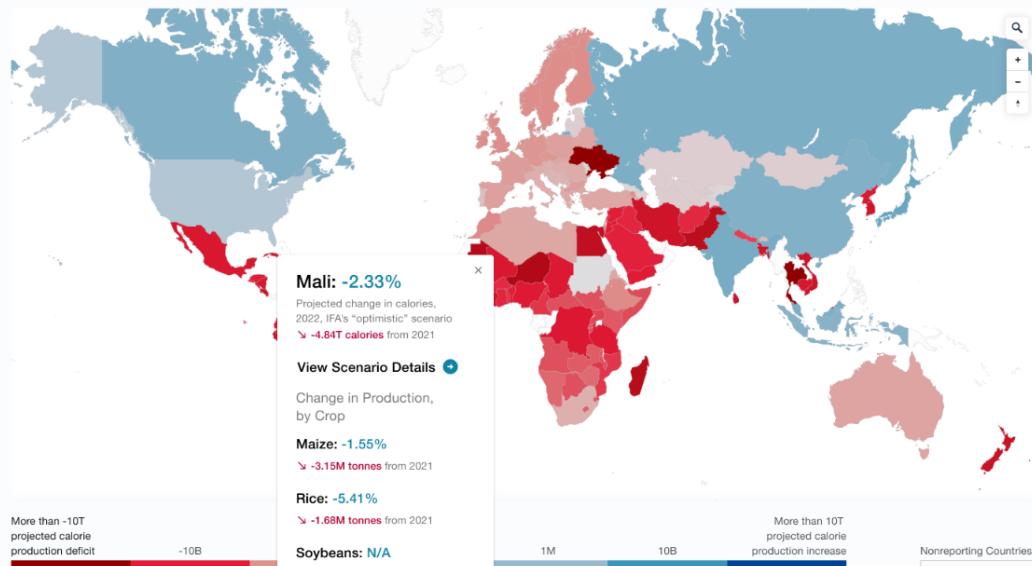
Explore Scenarios for
Global Population

Select scenario

A change in annual global nitrogen fertilizer application based on **IFAs "optimistic" scenario**

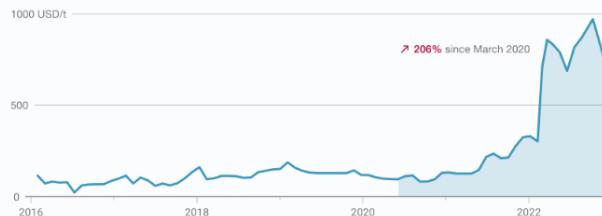
will lead to a production loss of **28 trillion calories.***

Projected Production Change in Calories, International Fertilizer Association (IFA) "Optimistic" Scenario, 2022



The globe means a spike in the fertilizer price.
Because farmers cannot afford the fertilizer they need, food yields suffer.

Global Nitrogen Fertilizer Price: \$707.50 USD/t



*Read more about our Methodology [here](#)

Tracking the Impact of Fertilizer Shortage on Global Food Security

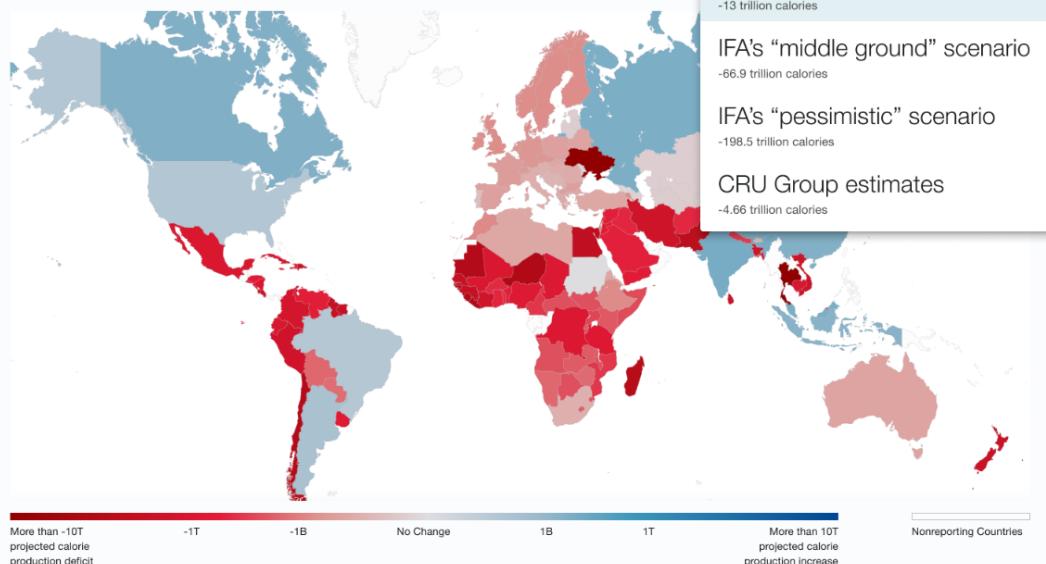
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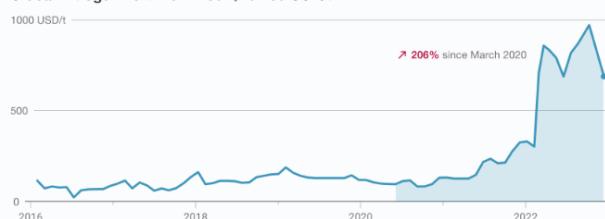
will lead to a production loss of **28 trillion c**

Projected Production Change in Calories, International Fertilizer Association



The global fertilizer shortage means a spike in the fertilizer price.
Because farmers cannot afford the fertilizer they need, food yields suffer.

Global Nitrogen Fertilizer Price: \$707.50 USD/t



Source: Gro Intelligence, GEM Commodities. Monthly F.O.B. Price, Middle East - Urea (nominal USD).

Current as of: June 17, 2022.

Current as of: April 28, 2022

*Read more about our Methodology [here](#)

Back

Country
Mali

Data source: Gro Intelligence

Current as of: Jun 17, 2022

Mali - Fertilizer Deficit Impacts

GRO DROUGHT INDEX	GRO FLOOD INDEX	VEGETATION INDEX	FERTILIZER IMPORTS, ANNUAL	FERTILIZER EXPORTS, ANNUAL
2.93 (extreme drought)	2.93	0.21	2,235 thousand tonnes	2,235 thousand tonnes
↗ +0.21 (+7.6%) past year	↗ +0.21 (+7.6%) past year	↘ -0.01 (-6.7%) past year	↗ +198 (+9.7%) past year	↗ +198 (+9.7%) past year

Food Production Forecasts, 2022

[Export \(.png\)](#)

Data Series	Maize	Rice	Soybeans	Wheat	Total Calories		Total Meals
					Thousands	Millions	Thousands
Staple Crop Production, 2021	4,563	4,563	4,563	2,235		7.65	2,235
Optimistic Outlook 1% Fertilizer Shortage	4,563 (-111.5%)	4,563 (-111.5%)	4,563 (-111.5%)	4,563 (-111.5%)	7.65 (-122.5%)	2,235 (-1.5%)	
Mid-Range Outlook 3% Fertilizer Shortage	4,563 (-111.5%)	4,563 (-111.5%)	4,563 (-111.5%)	4,563 (-111.5%)	7.65 (-1.5%)	2,235 (-1.5%)	
Negative Outlook 5% Fertilizer Shortage	4,563 (-111.5%)	4,563 (-111.5%)	4,563 (-111.5%)	4,563 (-111.5%)	7.65 (-1.5%)	2,235 (-1.5%)	
CRU Group Outlook	4,563 (-111.5%)	4,563 (-111.5%)	4,563 (-111.5%)	4,563 (-111.5%)	7.65 (-1.5%)	2,235 (-1.5%)	

Source: Gro Intelligence, USDA PS&D, CRU Group. Current as of: May 22, 2022. Read more about our Methodology [here](#).

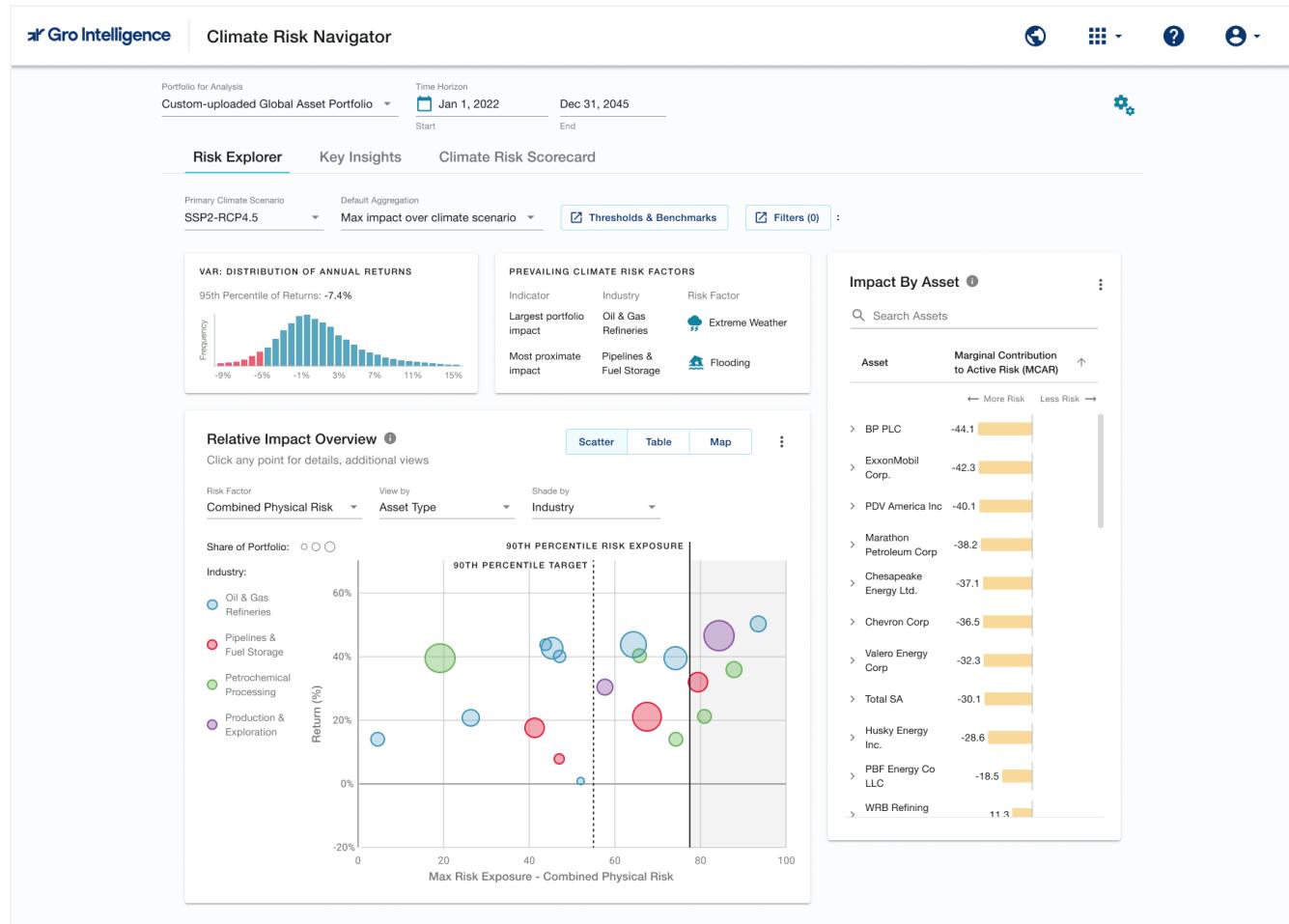
Climate Risk Navigator - Enabling Data-Driven Strategies for Responding to Climate Risk

Purpose: Both industry and government have grown incredibly advanced in their ability to model and respond to various risk factors, informing their strategies for allocating resources, and managing portfolios of financial and physical assets. To date, climate risk factors do not commonly feature in these models. The Climate Risk Navigator enables Gro's industry and government partners to incorporate climate factors into their risk analysis strategies, enabling a proactive response to the inevitable impacts of climate change.

For more detail on the design process behind this particular application, please refer to the Case Studies section of my portfolio: <http://nickm.io>

Launched: TBD

Client: Multiple (Financial Services, Government Agencies)



Portfolio for Analysis

Custom-uploaded Global Asset Portfolio

Time Horizon

Jan 1, 2022

Dec 31, 2045

Start

End



Risk Explorer

Key Insights

Climate Risk Scorecard

Scatter Table Map

Relative Impact Overview ⓘ

Click any point for details, additional views

Risk Factor

Combined Physical Risk

View by

Asset Type

Shade by

Industry

Share of Portfolio:

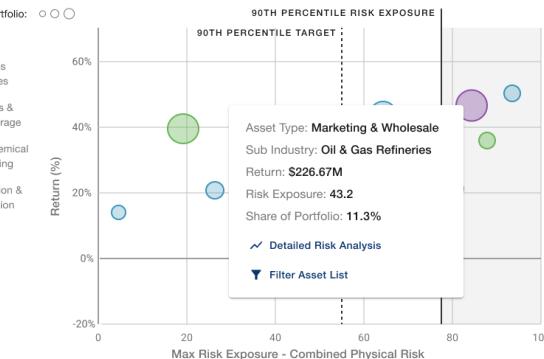
Oil & Gas Refineries

Pipelines & Fuel Storage

Petrochemical Processing

Production & Exploration

Industry:



Impact By Asset ⓘ

Search Assets

Asset

Marginal Contribution to Active Risk (MCAR)

	Marginal Contribution to Active Risk (MCAR)	More Risk	Less Risk
> BP PLC	-44.1		
> ExxonMobil Corp.	-42.3		
> PDV America Inc	-40.1		
> Marathon Petroleum Corp	-38.2		
> Chesapeake Energy Ltd.	-37.1		
> Chevron Corp	-36.5		
> Valero Energy Corp	-32.3		
> Total SA	-30.1		
> Husky Energy Inc.	-28.6		
> PBF Energy Co LLC	-18.5		
> WRB Refining	11.3		

Portfolio for Analysis

Custom-uploaded Global Asset Portfolio

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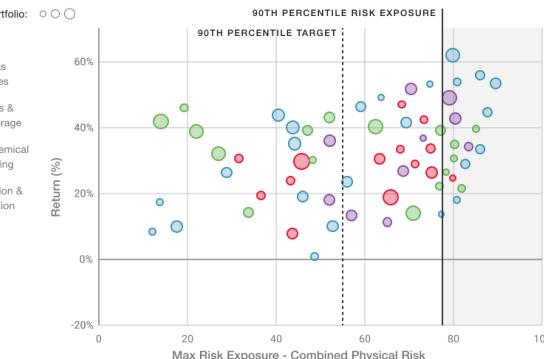
Oil & Gas Refineries

Pipelines & Fuel Storage

Petrochemical Processing

Production & Exploration

Industry:



Impact By Asset ⓘ

Search Assets

Asset

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Gro Intelligence | 'Climate Risk Navigator'

Portfolio for Analysis: Custom-uploaded Global Asset Portfolio | Time Horizon: Jan 1, 2022 Start to Dec 31, 2045 End

Risk Explorer Key Insights Climate Risk Scorecard

Relative Impact Overview

Click any point for details, additional views

Risk Factor: Combined Physical Risk | View all Climate Scenarios

Oil & Gas Refineries - Marketing & Wholesale | Portfolio Avg.

Year	HISTORIC	PROJECTED
1990	~15	~15
2000	~18	~18
2010	~20	~20
2020	~22	~22
2030	~25	~28
2040	~30	~35
2045	~38	~42

Impact By Asset

Search Assets

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Gro Intelligence | 'Climate Risk Navigator'

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Oil & Gas Refineries - Marketing & Wholesale: SSP1-1.9 | SSP1-2.6 | SSP3-4.5 | SSP4-7.0 | SSP5-8.5

Year	HISTORIC	PROJECTED (SSP1-1.9)	PROJECTED (SSP5-8.5)
1990	~15	~15	~15
2000	~18	~18	~18
2010	~20	~20	~20
2020	~22	~22	~22
2030	~25	~28	~32
2040	~30	~35	~40
2045	~38	~42	~48

Impact By Asset

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US Farmer Profitability & Crop Budgets - Assessing Demand for Agricultural Inputs

Purpose: Agricultural suppliers are constantly updating their sales and marketing strategy based on short and long term indicators such as yield forecasts, crop prices, and estimates of how farmer balance sheets are changing across regions and crop combinations. This application delivers timely signals on significant indicator movements, along with the deeper context suppliers need to move quickly, and in the right direction.

Launched: July 2022

Client: Multiple (Industry, Agricultural Suppliers)

Overview

Crop Budgets

US Insights

Global Yields

Yield Forecast Models

Estimates in-season yields at the district, province, and national levels on a daily basis

explore the data →

**Planting Intentions**

Gro's early projections of final planted area reported at the county level.

explore the data →

**Climate and Weather**

Up-to-date overview of current conditions and long-term projections

explore the data →



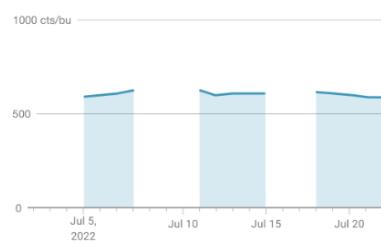
Crop Preview Current as of: July 22, 2022

Time Period of Percent Change: 1 Day 7 Day 30 Day 1 Year

Corn

See Detailed Analysis

US Price: \$564.25 cts/bu ▶ +1.6% past day



Source: Gro Intelligence. Current as of: July 22, 2022.

Yield Projections

State

Gro Projected Yield (bu/acre)

1 Day Change (%)

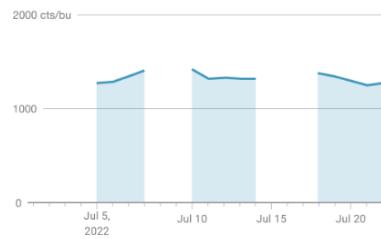
State	Gro Projected Yield (bu/acre)	1 Day Change (%)
United States →	164.4	▶ -2.1%
Illinois →	189.6	▶ -0.9%
Indiana →	163.8	▶ -1.9%
Iowa →	164.4	▶ -2.1%
Kansas →	116.3	▶ -3.8%
Minnesota →	171.2	▶ -1.7%

1-7 of 18 < >

Soy

See Detailed Analysis

US Price: \$1315.75 cts/bu ▲ +1.1% past day



Source: Gro Intelligence. Current as of: July 22, 2022.

Yield Projections

State

Gro Projected Yield (bu/acre)

1 Day Change (%)

State	Gro Projected Yield (bu/acre)	1 Day Change (%)
United States →	50.6	▶ -0.1%
Arkansas →	50.6	▶ -0.1%
Illinois →	60.7	▲ +0.1%
Indiana →	54.3	▶ -0.4%
Iowa →	50.6	▶ -0.1%
Kansas →	41.0	▶ -0.5%

1-7 of 11 < >

Gro Intelligence

Gro Portal

Gro Applications

Support & Feedback

Contact Us

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Overview

Crop Budgets

US Insights

Global Yields

Crop
CornState
All Corn States (35)

Area

Crop Prices

Fertilizer Prices

Yields

Climate & Weather

Supply & Demand

Trade

Growing Conditions

CORN, CURRENT SEASON, USA

Gro Drought Index (GDI)

GRO YIELD MODEL (FORECAST)

48.62 bu/acre

↘ -6.90% since last year

HARVESTED AREA

87.2M acres

↗ +1.04% since last year

FUTURES PRICE, RFM

13.70 \$USD/bu

↘ -4.00% since last year

ANNUAL PRODUCTION

4.53B bu

↗ +7.11% since last year

STOCKS TO USE RATIO

5.41 %

↗ +0.39 since last year

Vegetative Health Index (NDVI)

Daily Land Surface Temperature

Gro Soil Moisture

NASS Soil Moisture

Observed Flood

Daily Weather

GFS Temperature Forecast

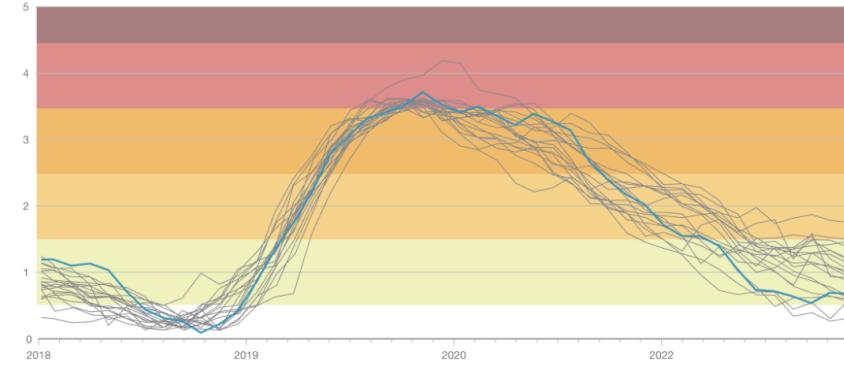
GFS Precipitation Forecast

[Back To Top ↑](#)

Gro Drought Index (GDI), Corn - United States

2022

— Past Years ▾

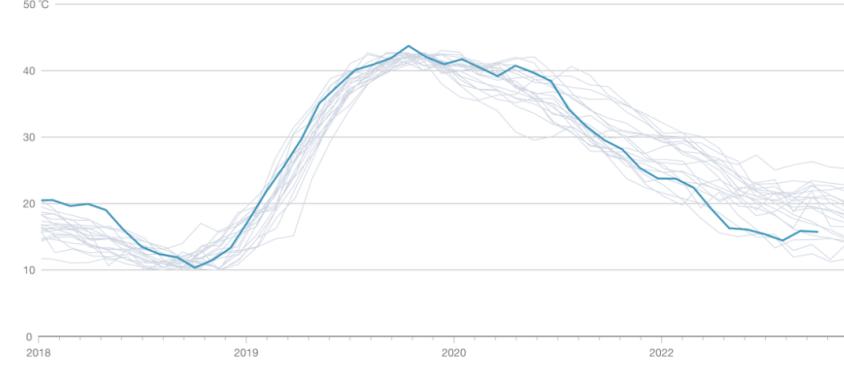


Source: Gro Intelligence. Current as of: Jul 22, 2022.

Vegetative Health Index (NDVI), Corn - United States

2022

— Past Years ▾

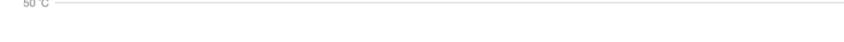


Source: Gro Intelligence. Current as of: Jul 22, 2022.

Daily Land Surface Temperature, Corn - United States

2022

— Past Years ▾



Overview

Crop Budgets

US Insights

Global Yields

Crop
CornRegion
United States

Crop Budget For Corn In United States



Source: University of Illinois

Crop Budget

Corn, following soybeans

Productivity Scenario

High Productivity

NET PROFIT

721 \$USD/acre

+421 since last year

GROSS REVENUE

1,505 \$USD/acre

+71.02% since last year

TOTAL COST

784 \$USD/acre

+35.17% since last year

GRO YIELD FORECAST

225.45 bu/acre

+3.60% since last year

CASH PRICE

7.0 \$USD/bu

+65.17% since last year

Revenue

2018

2019

2020

2021

2022

User Defined (2022)

YoY chg. (%)

Yield
bu/acre

208

188

218

220

228

225.45

3.6%

Latest Gro Yield Forecast: 225.45 ± 5.3*

Price
\$/bu

3.6

4.5

3.3

4.0

6.6

7.0

65%

Latest DTN Price: 7.0*

Crop Production Revenue
\$/bu

749

846

719

880

1,505

1,505

71%

Government & Insurance Payments
\$/acre

0

57

30

0

0

0

0%

View all costs

Gross Revenue
\$/acre

749

846

719

880

1,505

1,505

71%

Fixed and Variable Expenses

Total Operating costs
\$/acre

467

518

496

504

705

705

39.8%

View all costs

Total Allocated Overhead
\$/acre

67

74

75

76

79

79

3.9%

View all costs

Total Costs
\$/acre

534

592

571

580

784

784

35.2%

Net Income

Operating Profit
\$/acre

282

328

223

376

800

800

112.8%

Net Profit
\$/acre

215

254

148

300

721

721

140.3%

Learn more about [metrics used in Crop Budgets](#).

* Yield data is provided by Gro Yield Forecast that updates daily in-season. Price data is provided by DTN and updates daily.

Source: University of Illinois. Last released April 2022. Updates yearly.