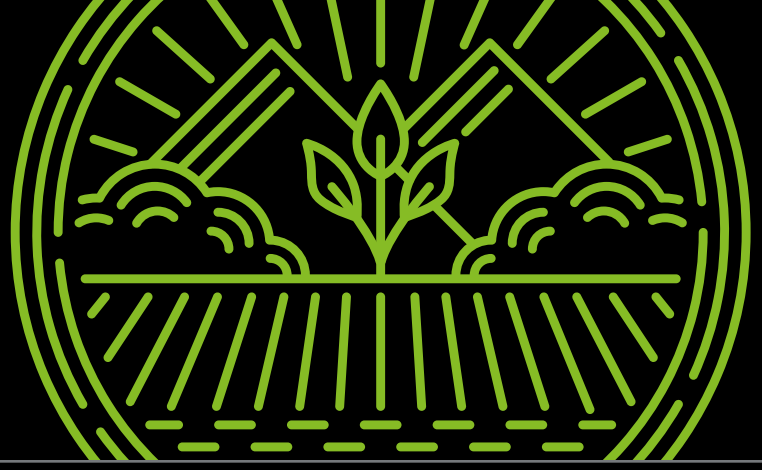


The World of Food Production... ...an unfolding story



GMO – a solution – but is it the right one?



Global population is estimated to expand to **10 billion+** people by 2050.¹

Agricultural production must increase by **70%** to meet the demand.²



Many consumers have negative perceptions of GMOs, despite endorsements from leading, global scientific organizations:

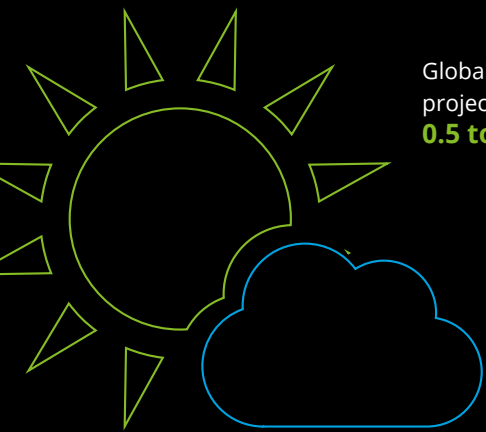
- **87%** of consumers globally (49% in the US) think non-GMO foods are either somewhat or a lot healthier.³
- **55%** also believe GM crops are “worse for the environment”.⁴
- GMOs rank **#5** in Food Concerns among Global Shoppers.⁵

Some evidence suggests GMOs actually help the environment:

- Globally pesticide use is **down 20%**⁶
- Decline in greenhouse gas emission from agriculture is equivalent to removing **10 million cars** from the roads⁷

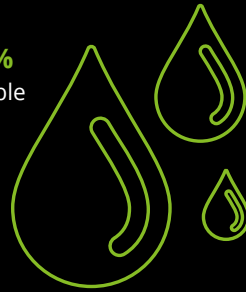


Climate change and drought can threaten agricultural production with no simple remedy

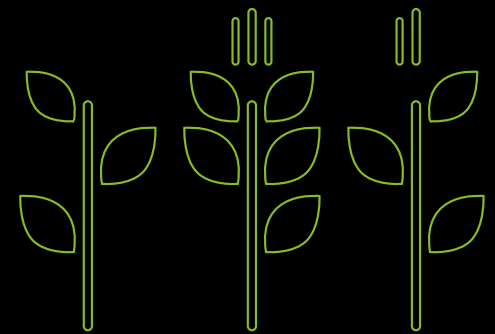


Global temperatures projected to increase **0.5 to 8.6 F** by 2100.⁸

By 2030 global water demand will grow **40%** above current accessible and reliable supplies¹⁰



Arable lands may reduce by as much as **50%**, resulting in potential food shortages and global imbalances in food and water supply.⁹



Even today, floods and droughts can incur significant losses in crop production resulting in increased costs:

- From 2011-2015, drought/flood events incurred an estimated **\$76.5 billion** in damage¹¹
- A 2008 flood of the Mississippi River resulted in an estimated loss of **\$8 billion** for farmers¹²
- Farmers spend an estimated **\$11 billion** annually to thwart the spread of damaging weeds.¹³

Organic Food – can the increase in demands be met?

88% of consumers are willing to pay more for healthier foods.¹⁴

68% report being willing to pay more for foods without unhealthy or artificial ingredients.¹⁵

43% of consumers ranked foods with all natural ingredients as the most important among 27 attributes, followed by foods absent of artificial colors (**42%**) and flavors (**41%**).¹⁶

0.8% But, only **0.8%** of total cropland in the US was online for organic production as of 2014.¹⁷

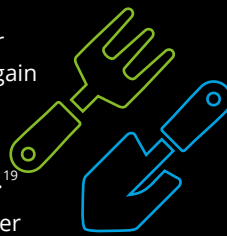


Farmers struggle to access sufficient quality organic seeds:

- Among organic farmers surveyed in 2015, only **27%** said they're using 100% organic seed, with only **18%** of vegetable growers reporting **100%** use of organic seed.¹⁸

Substantial hurdles exist for smaller farmers looking to gain certification as organic:

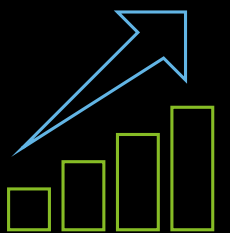
- Farms must stop using pesticides for three years.¹⁹
- Costs increase due to lower yields, costlier labor²⁰
- Livestock and land must transition as well²¹



Precision Agriculture: Can applying technology and innovation at its 'roots' be the answer?

60% of U.S. farmers report using some form of precision data²²

Precision Agriculture can help increase overall profitability by **\$55 to \$110 per acre**.²³



Farmers using precision data analytics report input cost reductions of **15%** and crop yield increases of **13%**.²⁴

1 World Bank, "Overview," April 1, 2015, www.WorldBank.org/en/topic/food security/overview#1.

2 Ibid

3 Watson, Elaine, "'87% of Consumers globally think non-GMO is 'healthier.' But where's the evidence?" Food Navigator-USA.com, August 13, 2015

4 IBID

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6 Brooks G and P Barfoot, "Global Impact of Biotech Crops: Environmental Effects" PG Economics Ltd., UK p. 1-196

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8 Source: https://www3.epa.gov/climatechange/science/future.html#Temperature

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10 2030 Water Resources Group, Charting Our Water Future: Economic Frameworks to Inform Decision Making, 2009, www.waterresourcesgroup.com/water_full/Charting_Our_Future_Final.pdf

11 "Climate Impacts on Agriculture and Food Supply," United States Environmental Protection Agency, 8/9/2016. Accessed 9/13/2016 at: https://www3.epa.gov/climatechange/impacts/agriculture.html

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18 State of Organic Seed, 2016," Organic Seed Alliance, June 2016. Accessed 9/14/2016 at: http://stateoforganicseed.org/

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24 "Seed by seed, acre by acre, big data is taking over the farm, Business Insider, September 15, 2015. Accessed at: http://www.businessinsider.com/big-data-and-farming-2015-8?IR=T