



# BOSH PRECISION AGRICULTURE

## North Carolina House UAS Legislative Research Committee 17 March 2014

Young Kim  
General Manager





The future is already here – it's just not evenly distributed.

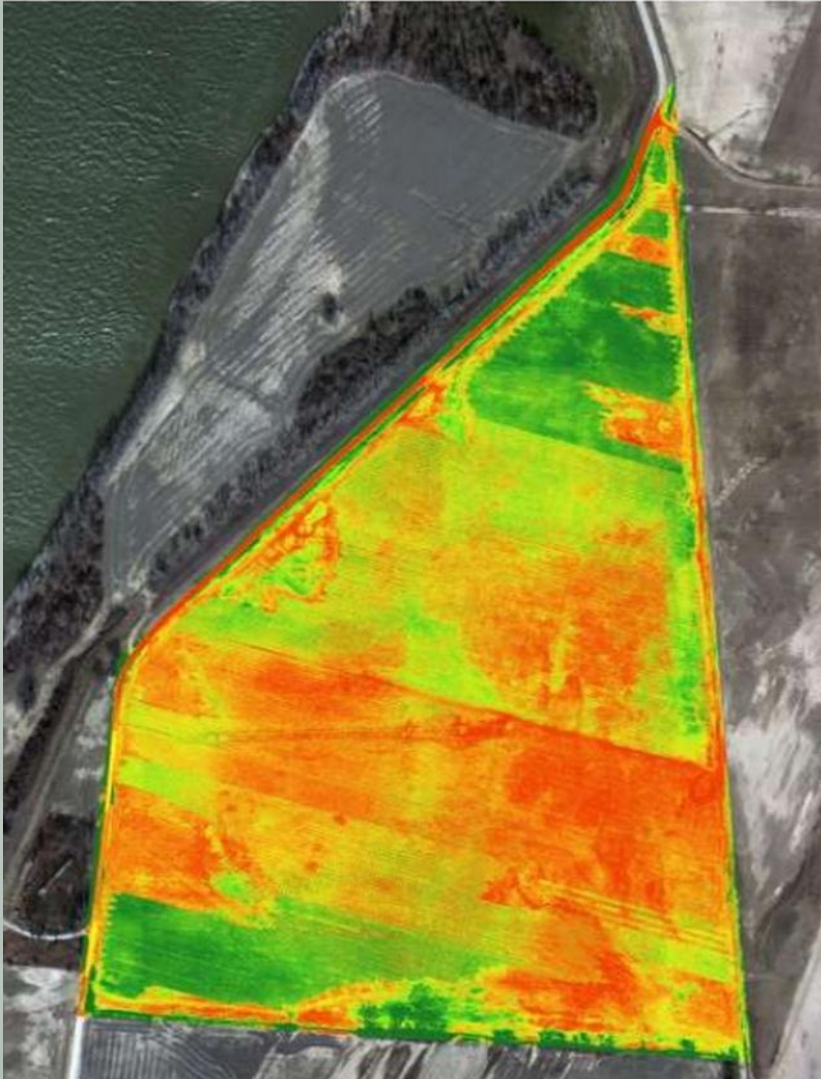
William Gibson quoted in The Economist, December 4 2003



# BOSH PRECISION AGRICULTURE







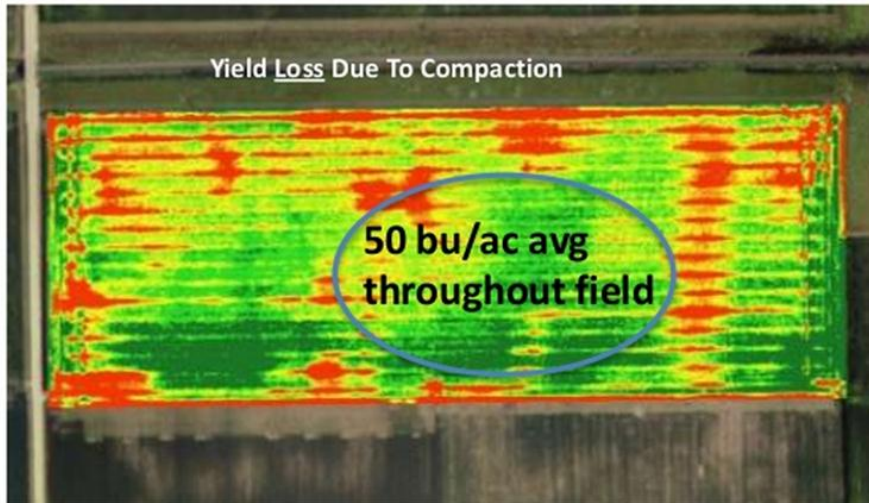
## Not Just A Pretty Picture

- Scouting
- Crop Health
- VRT
- Irrigation
- Soil Sampling
- Compaction
- Crop Insurance
- Yield Correlation
- Equipment Failures

Source: Geovantage



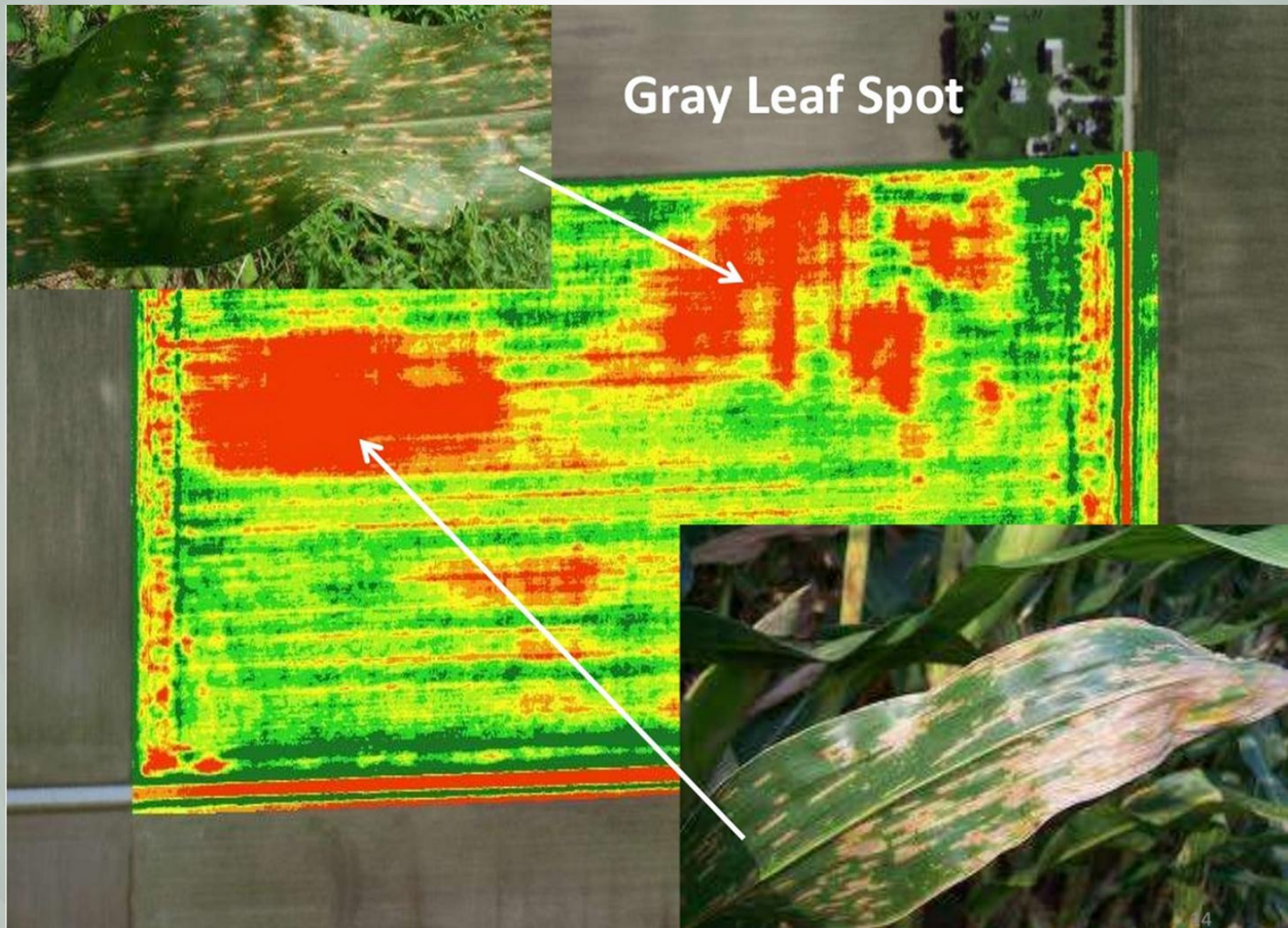
# BOSH PRECISION AGRICULTURE



24-row center fill planter  
40k lb. tractor, 30k lb. planter  
April 2011 planting  
Wet soils

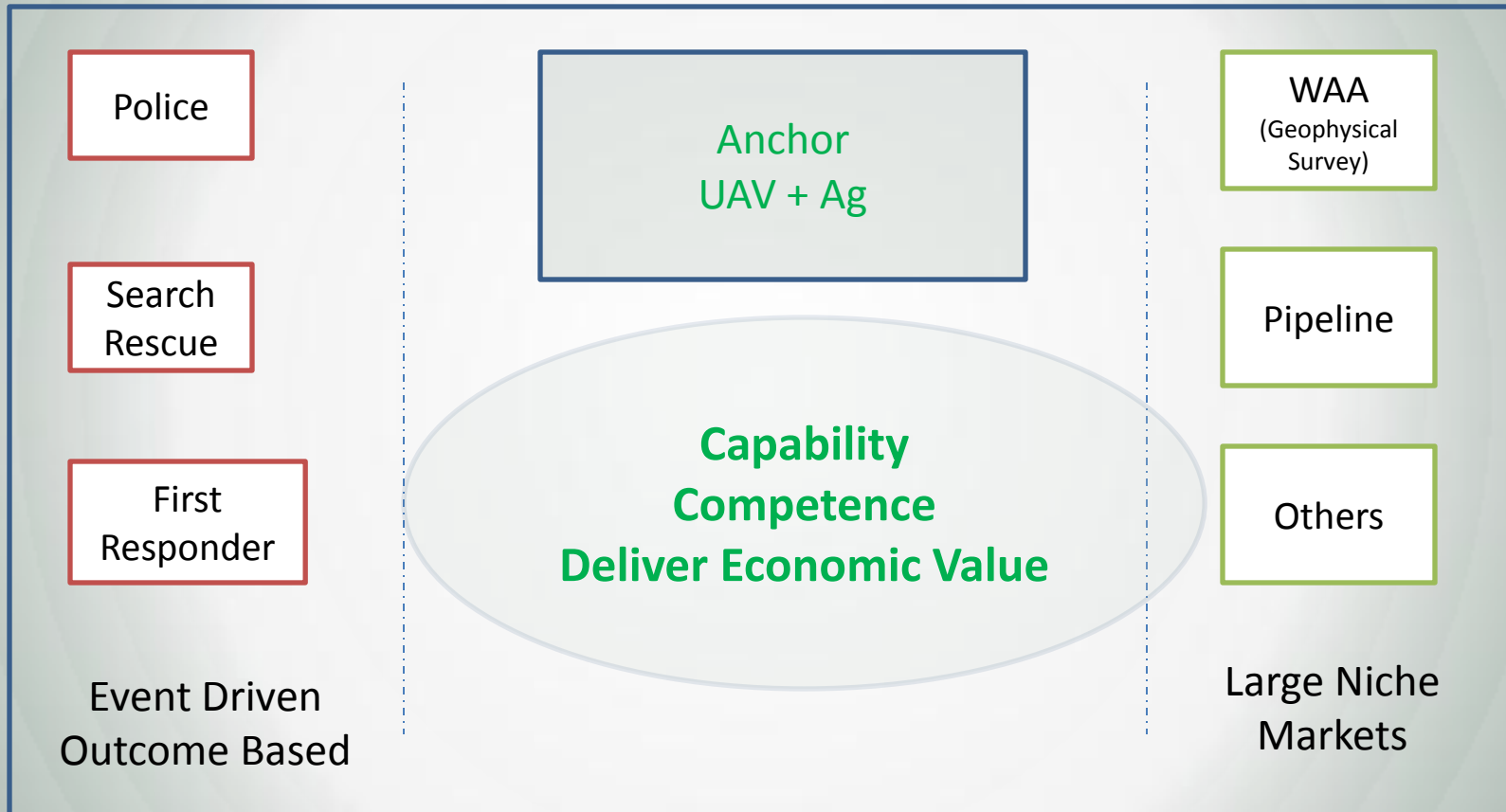








## Anchor Application For UAS





## Virtuous Cycle – Evolving Ecosystem

1-3 years old

 **Airware**

 **TerraAvion**

 **PTERYX**

 **W  
ROBOTICS**

 **DRONEMAPPER**  
3D AERIAL IMAGERY PROCESSING

**NEA**  
New Enterprise Associates

**khosla venture**

ANDREESSEN HOROWITZ

**The New York Times**

**Forbes**  
com

**WSJ**

**MONSANTO**  
Food • Health • Hope™

 **THE CLIMATE  
CORPORATION**  
\$930M

Acquisitions

**AGCONNECT**  
2015 EXPO & SUMMIT

**The  
InfoAg**  
Conference

Ag Conferences





# BOSH PRECISION AGRICULTURE



Soybean  
alternative to  
petroleum  
based  
products

Source: Virginia Soybean Association



# BOSH PRECISION AGRICULTURE



**Now (1.0) = UAV + Ag**

**Near future (2.0) = UAV + Ag + IT**

External Hard Drive Price

1 TB \$370, 2007

4 TB \$150, 2014

Individual Genome

Sequenced

\$1M, 2007

\$1,000 - 4,000, 2014

\$100 - 2015, 2016





# BOSH PRECISION AGRICULTURE

JUN  
25



## OPENING THE HIGH-

Each of all the activities of the Ford Motor Company in this United States is a conscious effort to open the people's highway should be within easy reach.

An organization, to render any service as widely useful, must be large in scope as well as great in purpose. To measure the high cost of acquiring and to establish the factors of production—this is a great purpose. Naturally it requires a large program to carry it out.

It is this thought that has been the stimulus and inspiration to the Ford organization's growth, that has been the incentive to developing our knowledge resources, expanding facilities and an industrial organization which is the greatest the world has ever known.

In accomplishing its aims the Ford Institution has never been daunted by the size or difficulty of any task. It has never on fail to finding the way of doing each task best. It has dared to try out the newest—with conspicuous success.



## WAYS TO ALL MANKIND

Each effort has been amply rewarded. For through this organization, the motor car which is contributing to as large a measure toward making life easier, pleasanter and more worth while has been made available to millions.

The Ford Motor Company in its situation today has with pride its great achievement that will, the future and some indication of new and larger opportunities for service to mankind.

*Ford Motor Company*

Creating and opening out and new motor, motor loads, smooth, safe roads, good for power plants, their farms, manufacturing industries, auto transportation, great motor, give plans, new buildings, plants and other jobs.

Source: Saturday Evening Post  
January 24, 1925

North Carolina growers are open for UAS business







## **Privacy**

Respect privacy of individuals.

Do not allow users to identify individual people, license plates, or model of a vehicle.

Cannot see through houses or through walls.

Only view public spaces

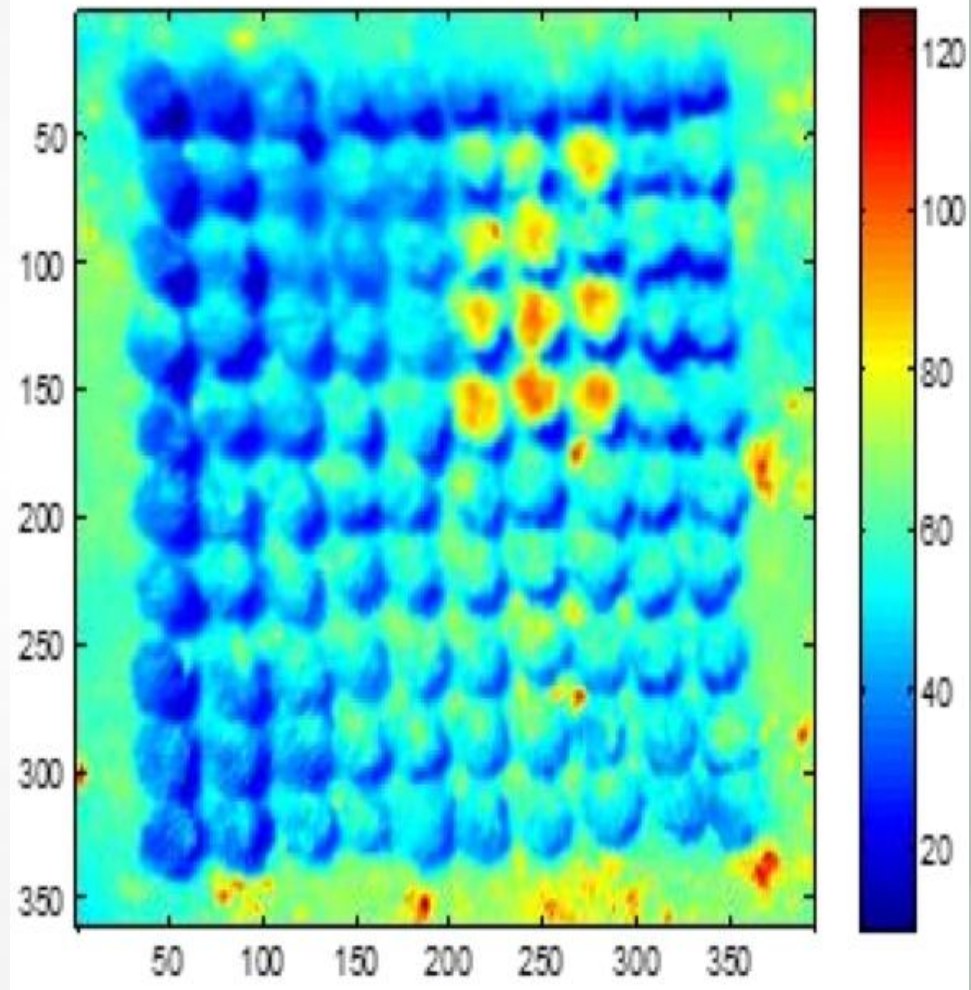
## **Rights**

First Amendment right to survey and photograph spaces that are visible from a public right of way.

The air, above 500 feet in uncongested areas, and above 1,000 feet in congested areas, is a navigable public right of way.

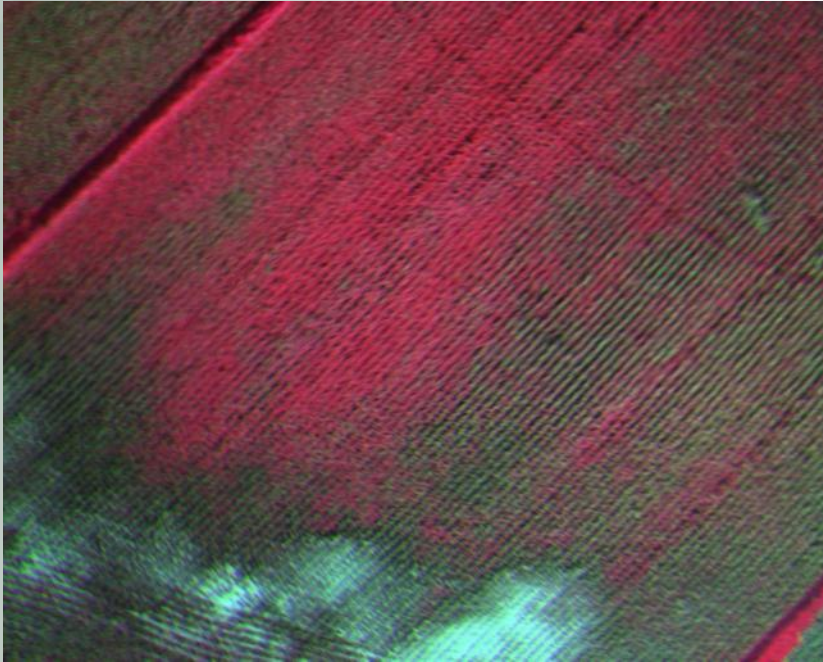


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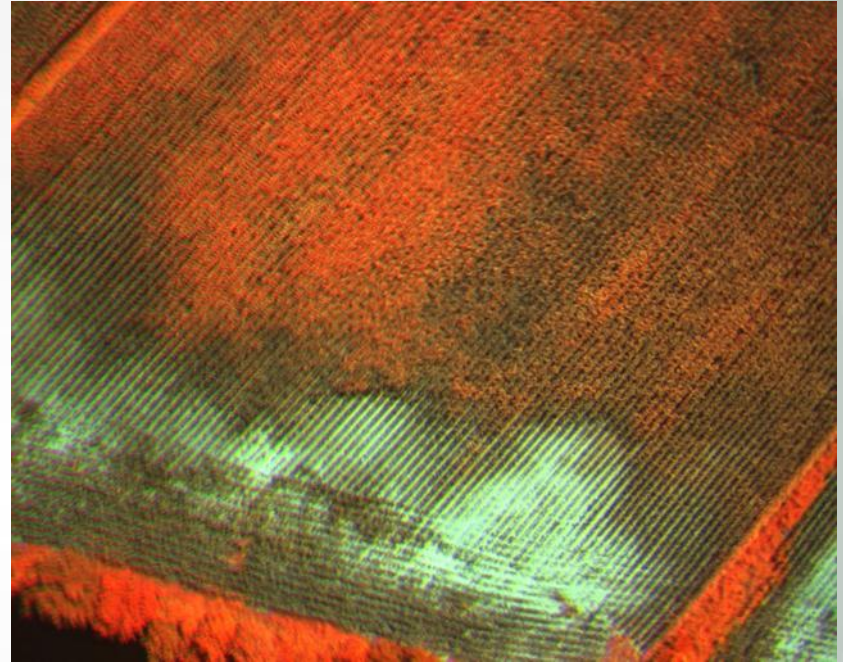
Source: R. Ehsani, University of Florida





Corn using 550/660/810 filters

Red = Humidity



Corn using 470/550/810 filters

Orange = Humidity

1928 World population 1.2B, US 10%, US produced 10% of what the world needed  
600M malnourished, underfed  
Couldn't produce sufficient food

1968 3.5b world population, US 6%, 20% of world output  
2B people were malnourished, couldn't produce sufficient food

7B, 2.5%, producing 30% U.S  
Women 2250

Men 2700, avg 2400,

Now produce more food to support entire world population  
Therefore, we'll produce to feed 9B people

US spends Less than on 9.5% disposable income to eat, lowest in the world

- U.S. corn plantings of 92 million acres, compared with 95.4 million acres in 2013
- 2014 U.S. soybean plantings of 79.5 million acres, compared with 76.5 million in 2013
- 2014 U.S. wheat sowings of 55.5 million acres, compared with 56.2 million in 2013
- 2014 U.S. plantings for all cotton of 11.5 million acres, compared with 10.4 million in 2013