Nvision:

Remote sensing to visualize AND CORRECT nitrogen (N) deficiency in corn

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Corn

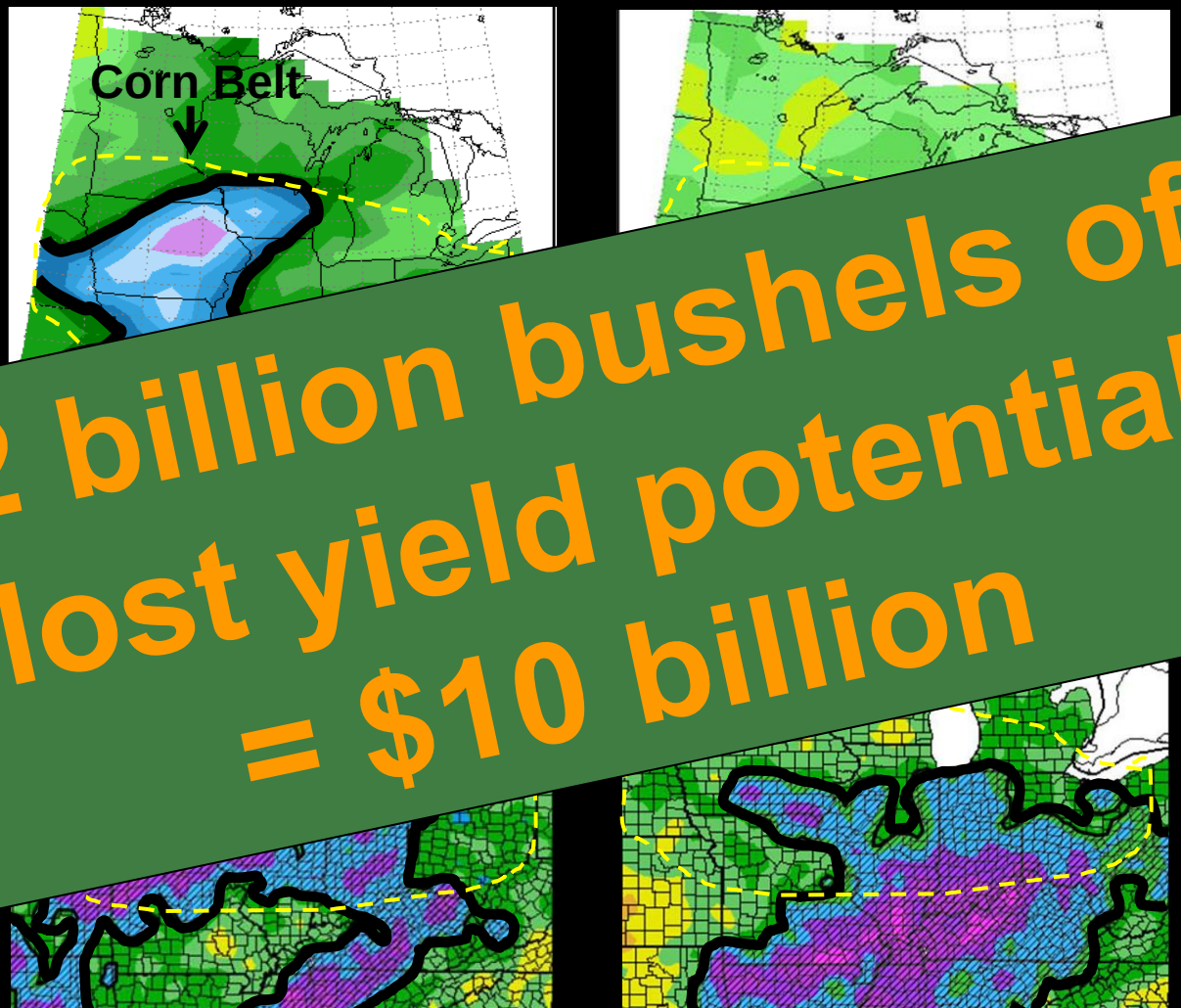
- $65 billion/year
- Yield is highly dependent on nitrogen (N) fertilizer
- Nitrogen is lost in wet weather

2008-2011: wet springs across the Corn Belt

Outlined areas > 16 inches rain April-June

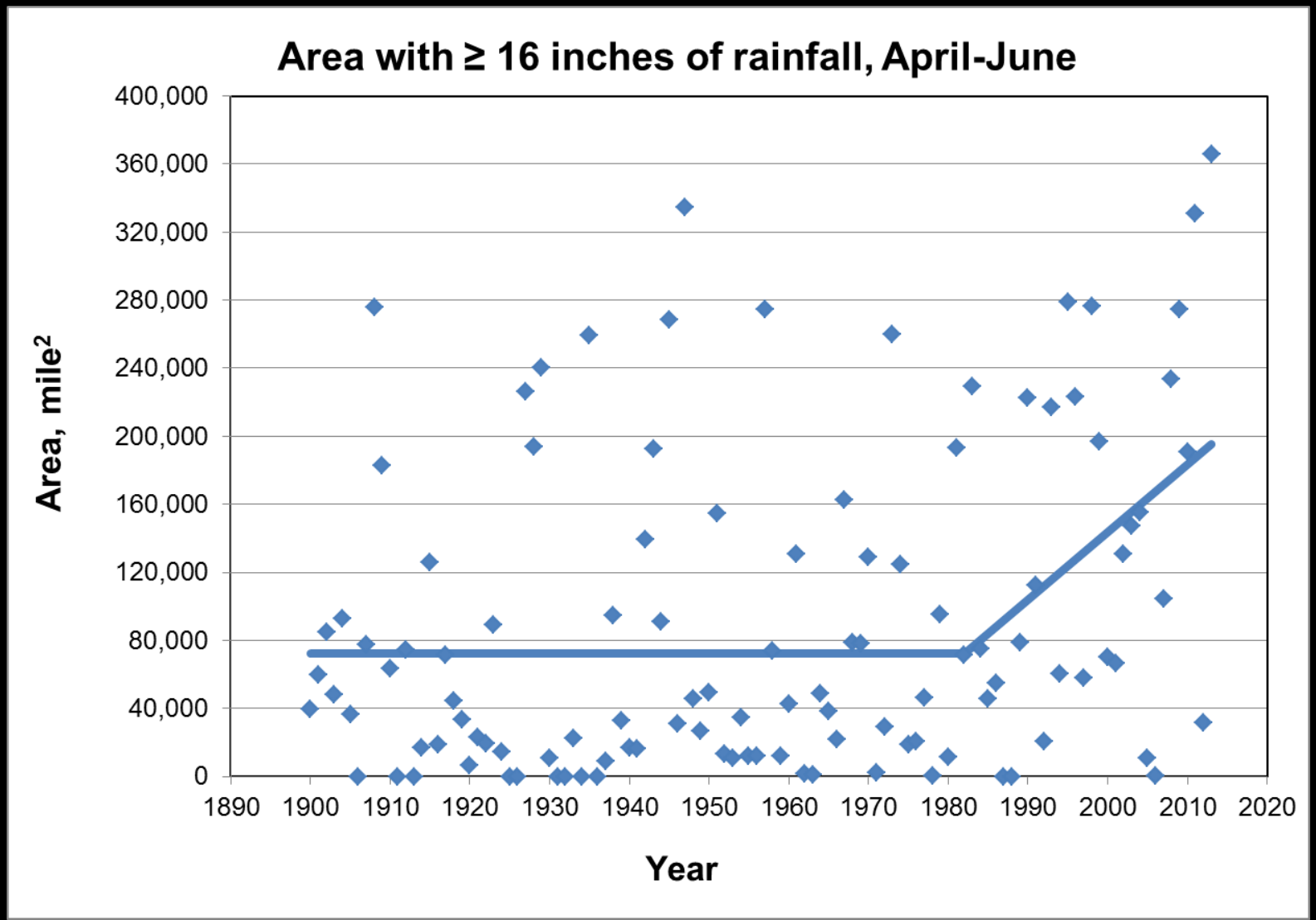
2008

2009



2 billion bushels of lost yield potential = $10 billion

…and the wet area (i.e. the market) is expanding



This problem can be corrected by applying more N fertilizer

But less than 10% of farmers have done so

WHY NOT?

Lack of decision support

Product: Decision Support

- **Which fields have problems? Which are OK?**
- **How much yield am I losing?**
- **How much more fertilizer do I need?**

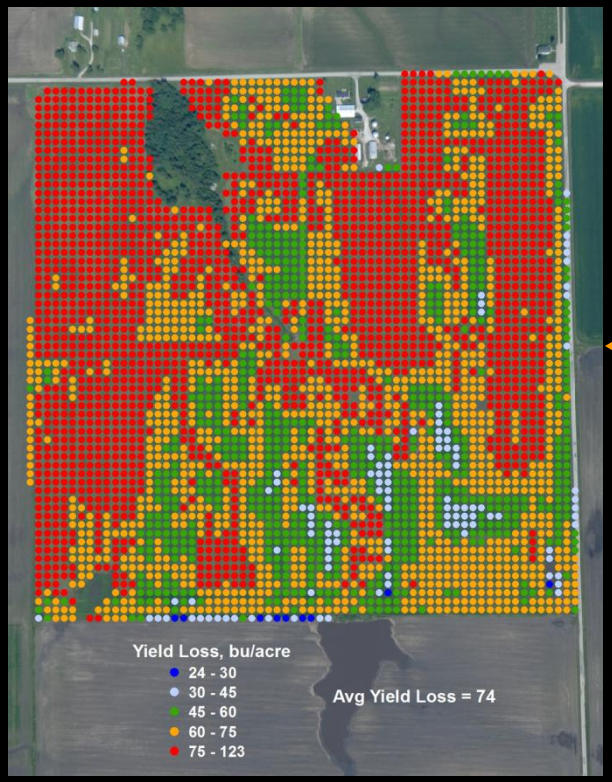
Platform: Remote Sensing

- Healthy corn is dark green
- N-deficient corn is light green
- You can see it from the air
- Can survey LARGE areas quickly

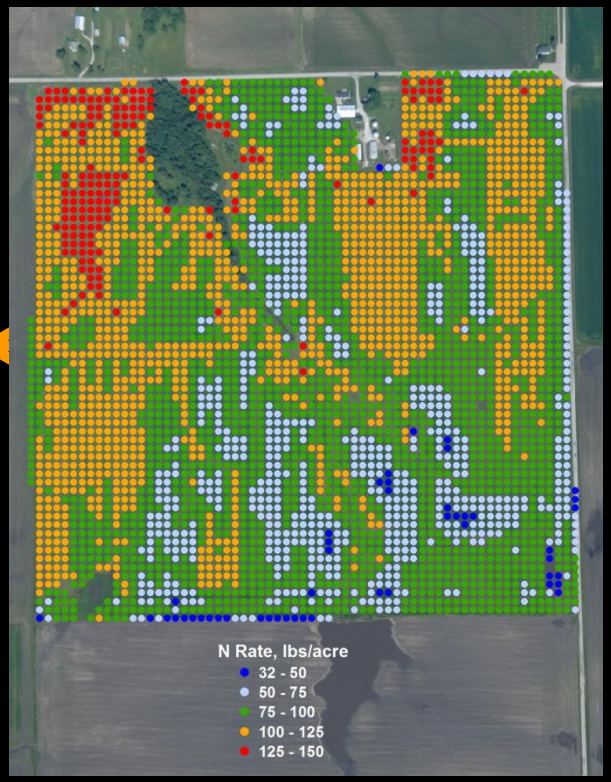
NVision:

quantitative decision support

aerial photo

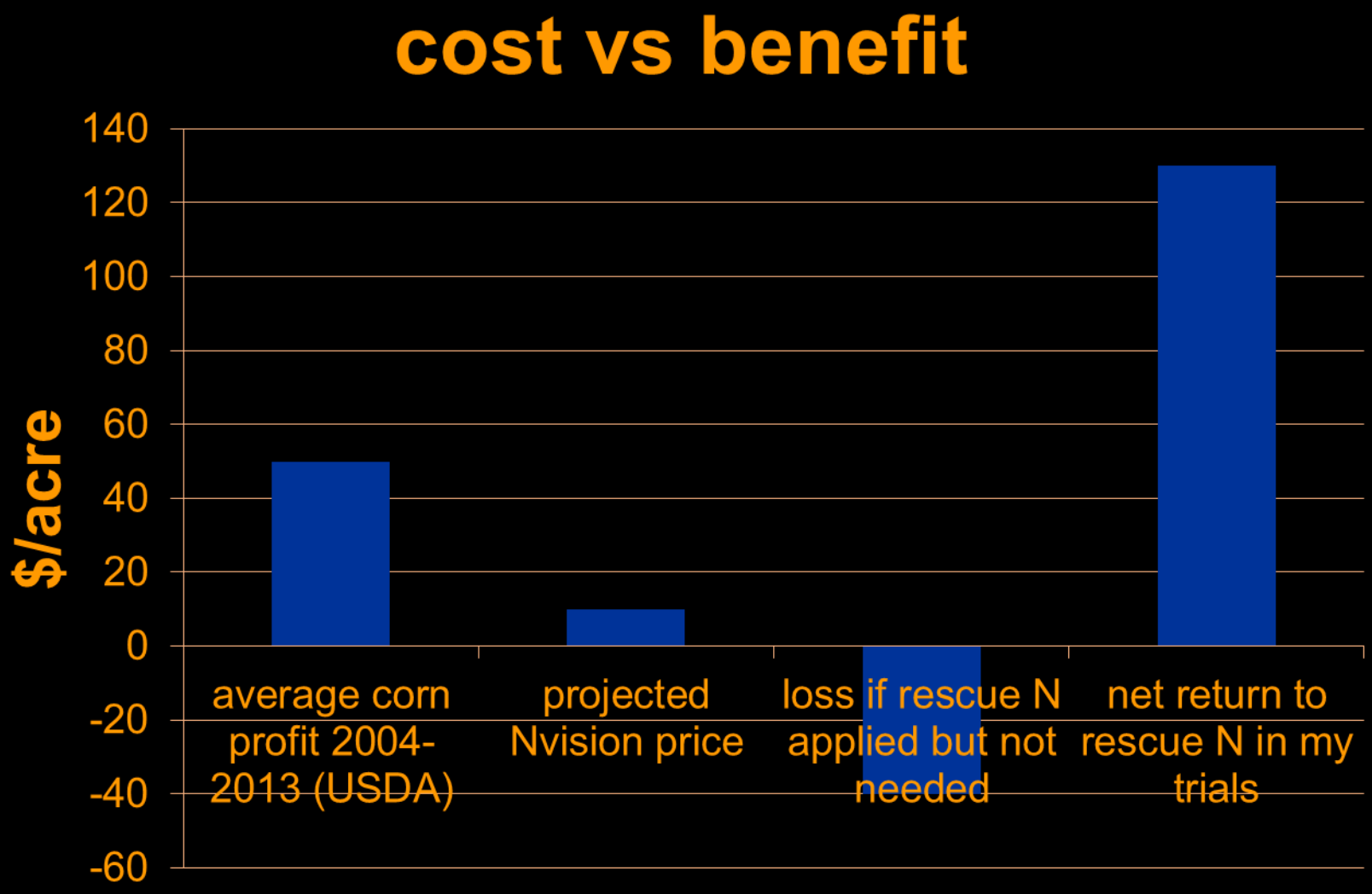


yield loss map
(ave 74)



N rate map:
fix the problem

Where's the money?

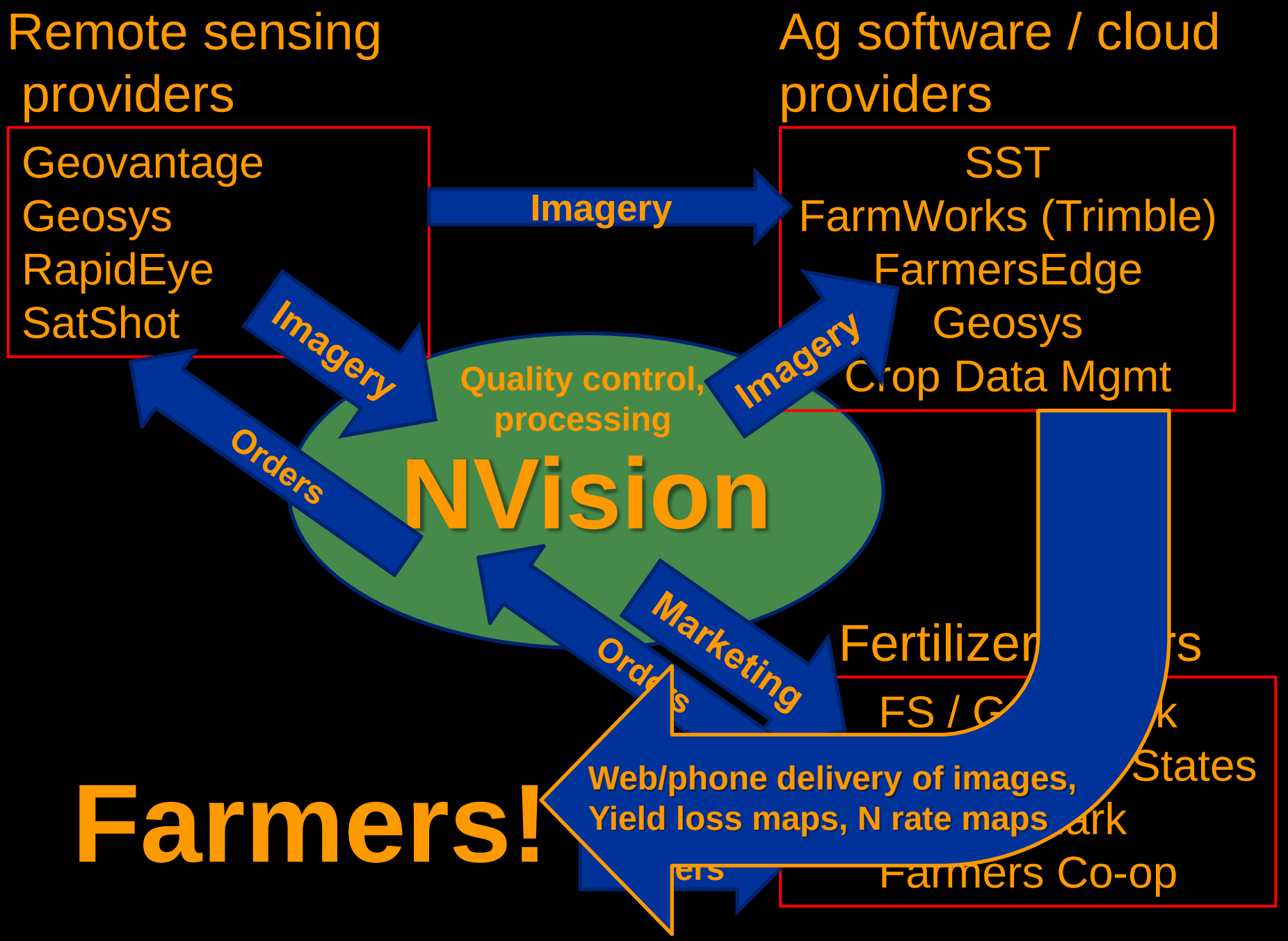


NVision in the market

- **Patents issued June 2012, Aug 2013**
- **Main competing product is crop canopy sensors**
  - Mounted on ground rigs
  - Can do a good job in individual fields, but can’t tell you which fields to go to
- Simulation models are a new entry in the market—could compete, could complement

Market Strategy

- Approach customers (farmers) via fertilizer sellers
- Seek agreements with corporate offices
  - But also market at individual locations
- Distribute product via agricultural cloud / software providers already used by fertilizer sellers


Remote sensing providers
Geovantage
Geosys
RapidEye
SatShot
Ag software / cloud providers
SST
FarmWorks (Trimble)
FarmersEdge
Geosys
Crop Data Mgmt
Imagery
Imagery
Imagery
Orders
Quality control, processing
NVision
Marketing
Orders
Fertilizer
FS / G
States
ark
Farmers Co-op
Web/phone delivery of images,
Yield loss maps, N rate maps
Farmers!

Development Milestones: Remote Sensing

1. Test satellite imagery to validate
   - Only imagery obtained from airplanes is validated
2. Develop strategy: optimal use of satellites, airplanes, drones
3. Negotiate prices and other terms with remote sensing providers
   - Contracts if appropriate
   - Redundancy to guarantee service
   - Include airplanes for weather flexibility

Development Milestones: Information Processing

1. Develop channels for information flow to agricultural cloud / software providers
2. Develop automated processing systems
   a. Interface with or operate within systems of ag cloud providers
3. Develop customer (farmer, fertilizer seller) interface and supporting software

Development Milestones: Marketing

1. Marketing campaign to educate major fertilizer sellers
   - Corporate offices first, then key sales locations
2. ROI campaign
   - Average cost $50/acre, average return $170/acre in 11 on-farm trials with rescue N fertilizer after excess rain
   - Based on 4-year average prices for corn and N fertilizer
   - High ROI for farmer means excellent opportunities for Nvision (marketing & coordination), fertilizer sellers, ag cloud providers, & remote sensing providers

Nvision: Summary

- Nitrogen is lost in wet weather, corn yield is lost ($10 billion 2008-2011)
- Remote sensing can visualize nitrogen deficiency
- Patented process converts remote sensing to quantitative decision support tools
  - Applying more fertilizer rescues corn yields

Nvision: Summary

- Existing capacity can be harnessed to support this product
  - Remote sensing
  - Agricultural cloud / software
  - Fertilizer sellers
- Someone has to market the product and coordinate the above players
- **Propose a new entity: NVision**