

20 Years of KARTA

Lee Scheufler

Randy Taylor

Precision Ag Users Groups

- ▶ Many groups formed around the turn of the century, but what was/is their true function?
 - PARA, 1997
 - KARA, 2000
 - KARTA, 2011
 - NeATA, 2001
 - KPAN, 2001
- ▶ Are the groups dynamic, producer driven or propped up by university or industry people?



Ohio Agricultural Technologies Association

Precision Agriculture Research Association (PARA)

- ▶ The Precision Agriculture Research Association in Montana was the first precision ag technology user group in the country.
- ▶ PARA is a non-profit association of agricultural producers, university faculty, industry representatives and others committed to sharing information about technology to help each other accomplish various site-specific agricultural tasks.
- ▶ NASA funding helped initiate PARA through Montana State University.
- ▶ While PARA has continued its existence, there hasn't been much activity until recently. The early emphasis was on remote sensing for farmers and ranchers, but there has been other efforts on fertilizer and weed management.
- ▶ The group has been reinvigorated with the On-Farm Precision Experiment (OFPE), a project related to on-farm experiment automation. Prescription N maps incorporating experiments are being implemented on four farms (two fields) each.

Conference and KARTA History

- ▶ The first Kansas Precision Agriculture Conference was held in January 1998 in Salina, KS.
- ▶ Two day program with four breakout sessions
- ▶ “Leave your GPS slides at home.”
- ▶ Attendance exceeded 100
- ▶ One vendor - Eric Lund with Veris Technologies (up for dispute)

Precision Agriculture A Tool for the 21st Century

JANUARY 8-9, 1998
Salina Holiday Inn
I-135 & Crawford, Exit #92
Salina, KS

Sponsored By:
K-State Research and Extension
Farmland Industries
Kansas Fertilizer and Chemical
Association

Thursday Morning

General Session (Room B)

Randy Taylor, KSU (moderator)

- 9:20 **Welcome, Introductions, Announcements** – *Randy Taylor, KSU*
- 9:25 **Precision Ag – A More Intelligent Approach To Crop Management** - *John Havlin, North Carolina State University*
- 10:15 **Yield Monitoring – More Than a Map** - *Ronnie Heiniger, North Carolina State University*
- 11:05 **Variable Rate Seeding: A Next Step In Precision Ag?** - *John Mick, Pioneer Hi-Bred International, Inc.*
- 11:50 **Lunch (Room C)**

Conference and KARTA History

- ▶ The concept of KARA was introduced at the Third Annual Kansas Precision Agriculture Conference (2000) by Scott Staggenborg.
- ▶ Following the conference a meeting was held in Salina to form KARA.
- ▶ Founding Board of Directors
 - Jon Oden - Sterling, KS
 - Lee Scheufler - Sterling, KS
 - Larry Hottman - Enterprise, KS
 - Mark Carlson - Smolan, KS
 - Dave Wilcox - Beloit, KS
 - Scott Staggenborg/Randy Taylor, K-State

Kansas Agricultural Research Association

- ▶ Not-for-Profit Corporation in Kansas (May, 2000)
- ▶ Governed by a Board of Directors (5): Officers include, President, Vice-President, Secretary, and Treasurer
- ▶ The Kansas Agriculture Research Association (KARA) will *identify new technologies practical for precision agriculture with consideration to financial returns for producers and serve as a membership network that provides a venue for members to share agriculture research experiences with each other.*

Transition of the PA Meeting to KARTA

- ▶ While this has never been a traditional extension meeting, it was initially managed almost entirely by K-State faculty.
- ▶ The formation of KAR(T)A created an easier way to manage expenses (think state accounting system).
- ▶ The board became more involved in the program content over time, while someone from the university typically handled communication with speakers.

**Fourth Annual Kansas Precision Agriculture Conference
Holiday Inn Convention Center
Great Bend Kansas
January 30-31, 2001**

**January 30
Tuesday Morning**

8:00 Registration/Coffee and Rolls

General Session - East Ballroom

10:00 Welcome and Announcements – Larry Hottman, KARA President

10:15 The State of Precision Ag Technologies – Joseph K. Berry, President, Berry and Associates / Spatial Information Systems, Ft. Collins, CO

11:00 Topic TBA – Scott Shearer, Agricultural Engineer, University of Kentucky, Lexington, KY

11:45 Lunch - West Ballroom

Precision Ag Technology Evolves

- ▶ Availability of technology made it feasible without disrupting the flow of farm operations.
- ▶ Twenty years ago nearly everyone was variably applying nutrients - we just didn't have the ability to apply and map it as accurately as today.
- ▶ The best yield map is still only a report card. You have the answer, now you need to figure out what the question was.
- ▶ There were a lot of presentations with 'visual' correlation in maps.
- ▶ Joe Berry's presentation on Map Calc completely changed the way we started thinking. Maps are numbers!

Ag Technology Field Days - 2002 & 2004

Agricultural Technology Field Day

August 10, 2004 : 9 am-4 pm
East Crawford Recreation Area
Salina, KS

This will be the largest ag technology event ever staged in the high plains area. You can test drive more than 10 different automatically steered vehicles. See the latest in ag sensors and software. Demonstrations and educational sessions provide an opportunity to learn about ag technology from companies who developed it and farmers who use it. Registration information can be found at the web site or by phone.

www.ksagresearch.com
785-532-2931

Field Day Sponsors



KARTA Evolves

- ▶ The KARA board become more involved in education and started planning workshops. If a member had an idea for a workshop, they were in charge.
- ▶ Workshops included:
 - ‘Cleaning’ YM Data
 - Computers in the Cab
 - Multivariate Regression
- ▶ On-Farm Research grabbed another gear within the group.
- ▶ Members gained a real appreciation for research methods.



PURPOSE

To determine what effect different closing wheel types have on plant emergence and yield. Unfavorable planting conditions were targeted for this study.

STUDY INFORMATION

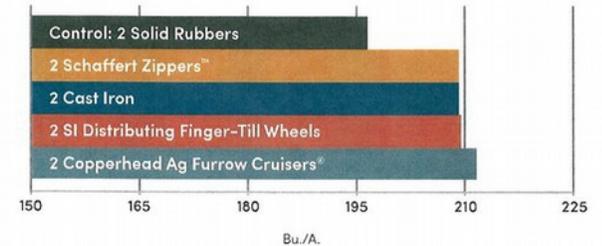
Planted	5/16/2016
Harvested	10/14/2016
Population	34,000 Seeds/A.
Row Width	30 in.
Previous Crop	Soybeans
Tillage	No-Till
Herbicides	Fall burndown: 12 oz. Authority® MTZ DF, 1 qt. Brash®, 1 qt. Roundup PowerMAX® Pre: 3.5 oz. Corvus®, 1 qt. Altrazine, 1 qt. Roundup PowerMAX Post: 3 oz. Capreno®, 1 qt. Roundup PowerMAX
Insecticides	Escalate™
Starter	10 gal. 28-0-0 2x2
Total Nitrogen	190 units as UAN
Brand	5628AMX™
Soil Type	Crosby (silt loam)
Soil Test Values	pH O.M. % CEC 6.5 2.3 8.9
Percent Base Saturation	Ca Mg K H 67.4 15.5 3.6 13.5
Parts per Million	P K S 32 125 6 Zn Mn B 1.7 40 0.3

2016 RESULTS

Closing Wheels	Pressure Setting	Percent Moisture	Bu./A.	Bu./A. Difference
Control: 2 Solid Rubbers	3rd Notch	18.7	197.7	--
2 Copperhead Ag Furrow Cruisers®	3rd Notch	18.7	204.3	+6.6
2 Pro Stitches	3rd Notch	18.5	203.9	+6.2
2 Schaffert Zipper™	3rd Notch	18.6	200.3	+2.6
2 Cast Iron	3rd Notch	18.6	198.8	+1.1
2 SI Distributing Finger-Till Wheels	3rd Notch	18.7	197.6	-0.1

™XL, Optimum, and AcreMax are registered trademarks of Pioneer. XL® brand seed is distributed by Beck's Superior Hybrids, Inc. Individual results may vary.

2-YEAR CLOSING WHEEL YIELD ADVANTAGE



- We intentionally planted this no-till plot in less than ideal conditions. We ran into small, wet pockets where all of the closing wheels had issues closing the seed furrow.
- There was an obvious advantage with the more aggressive closing wheels over the standard rubber closing wheel system.
- The increased seed-to-soil contact translated into a more even stand establishment and ultimately, higher yields.

Comments from 2005 Proposal Review

- ▶ We are still in a learning process and the "rules" this year were slightly different from last year (more dollars/proposal, but only one grant per investigator) whereas this year we took the approach of fewer dollars per proposal, but more grants per investigator. This can be argued about internally, but what has become evident at conferences and meetings this winter is that ***every group sees the need for on-farm research and KARA is ahead of the pack*** (although we have a lot of learning to do). Consequently, the feeling was to increase both quality (through workshops upfront and at the end) and quantity (try to maximize the number of valid projects for presentation next year).
- ▶ As was stated by KARA from the beginning, the goal of these research dollars were to help offset costs for research that was going to be done on the farm with or without funding. The only restriction we placed on the dollars was to require a presentation or poster at the conference summarizing the results. ***At this point we do not feel KARA research dollars should be the dependent factor on whether a project gets completed or not.***

Where did we think we were going?

- ▶ Some thought the organization would morph into something large like NTOP.
- ▶ Some thought we might develop a reputation for research and be sought out by industry - never happened, but never really pursued.
- ▶ Some thought we might be a group for targeted research from university level but never got much traction, either. (some limited success)
- ▶ The core group is just independent farmers from across the state who enjoy the opportunity to interact with like-minded producers.
 - There's no pity party over low prices, high costs, etc.
 - This group is always looking for the next improvement for their farm and the ability to keep ahead of the neighbor.

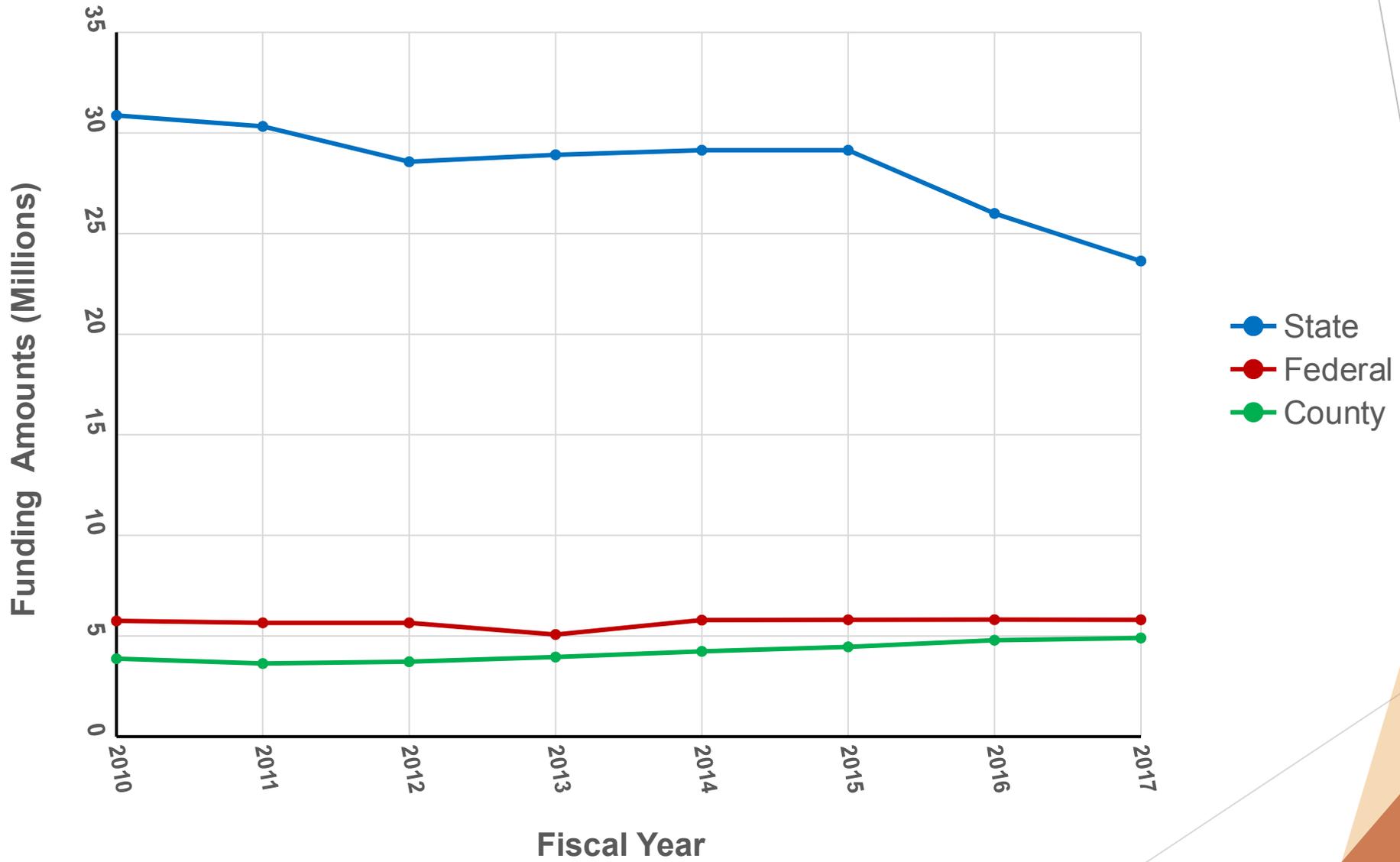
Future of Agriculture Equipment

- ▶ More automation on the way to autonomous
- ▶ Robotics -- no operator tractors, combines, sprayers. Will cause a new paradigm for tractor size -- think much smaller. Who needs section control on a 2 row planter?
 - 5 to 15 years -- much smaller again -- swarm technology
 - 10 to 30 years -- much smaller again -- think plant, weed, feed, monitor, harvest, maintain record of individual plants.
- ▶ But it's not just tractors. Consider a row crop planter as an example. To be pulled by an autonomous tractor, it must be autonomous (i.e. self sensing/adjusting)

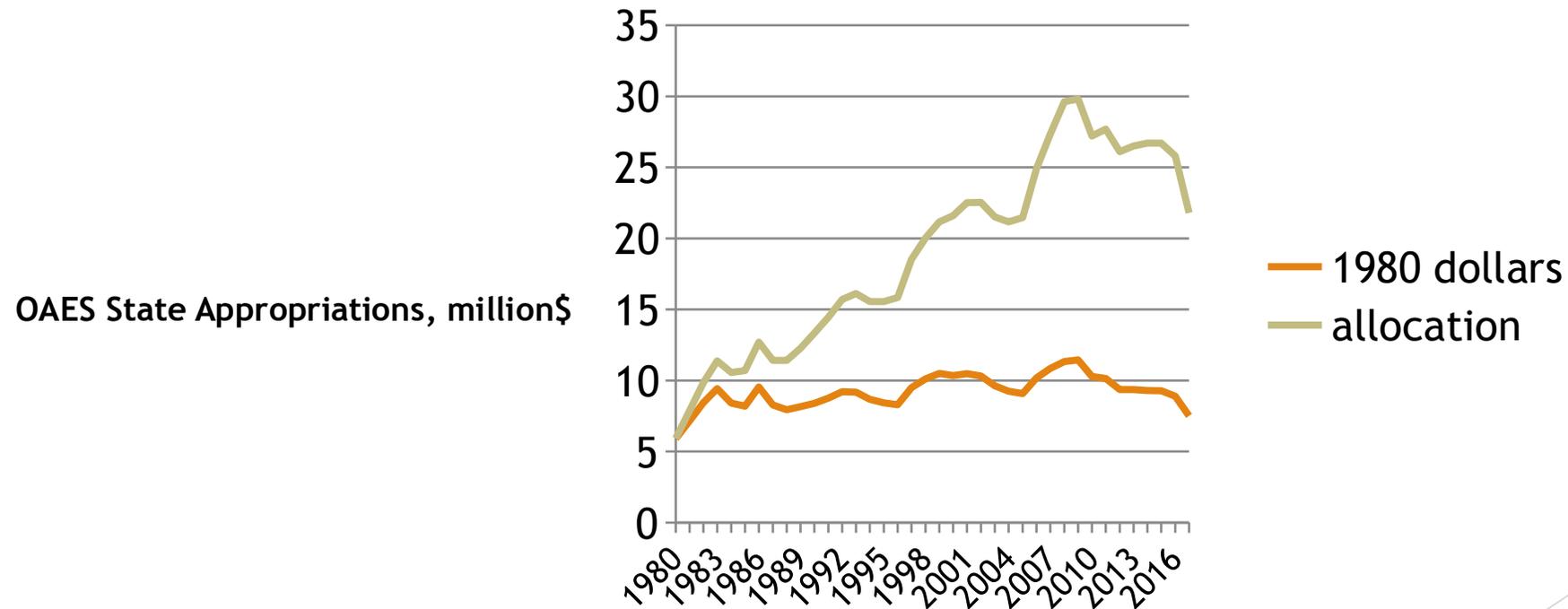
Future of Agriculture

- ▶ Ag in general: Great increase in record keeping and reporting -- but also a reward to those with the best records of "accountability."
- ▶ Public and policy maker's disconnect with agriculture
- ▶ I don't foresee a change that will bring livestock into the group.

Federal, State, and County Funding (2010 – 2017)



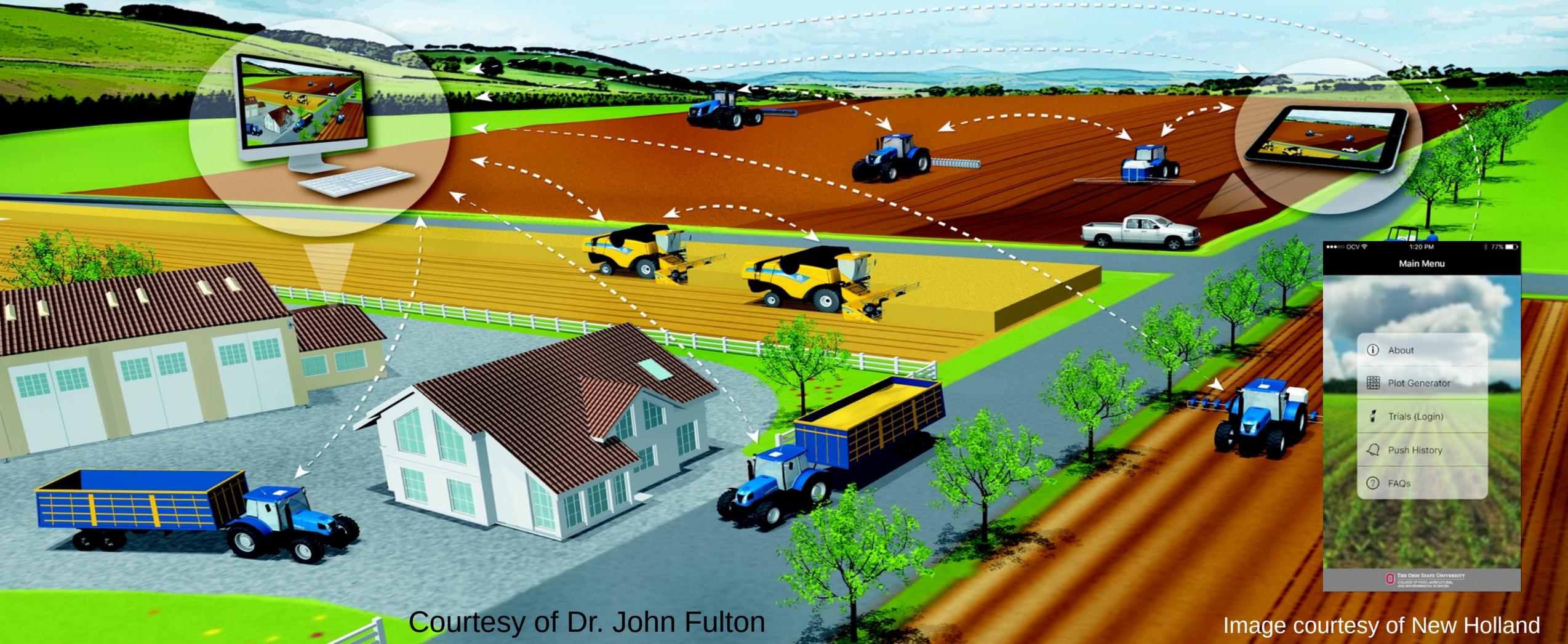
Public Funding for Agricultural Research



KARTA's Future

- ▶ Continue on farm testing but with greater help from university to create meaningful test designs and pooled data analysis.
- ▶ Traditional university research funding will continue to decline, but quality and applicability will improve by greater integration of university with producers.
 - The reward system will need to change
- ▶ Results may be considered proprietary information and only disseminated within the group -- "I'll tell you what I found if you will share what you learned on your farm."
- ▶ Research isn't free. Can KARTA leverage research funding for topics we feel are important?

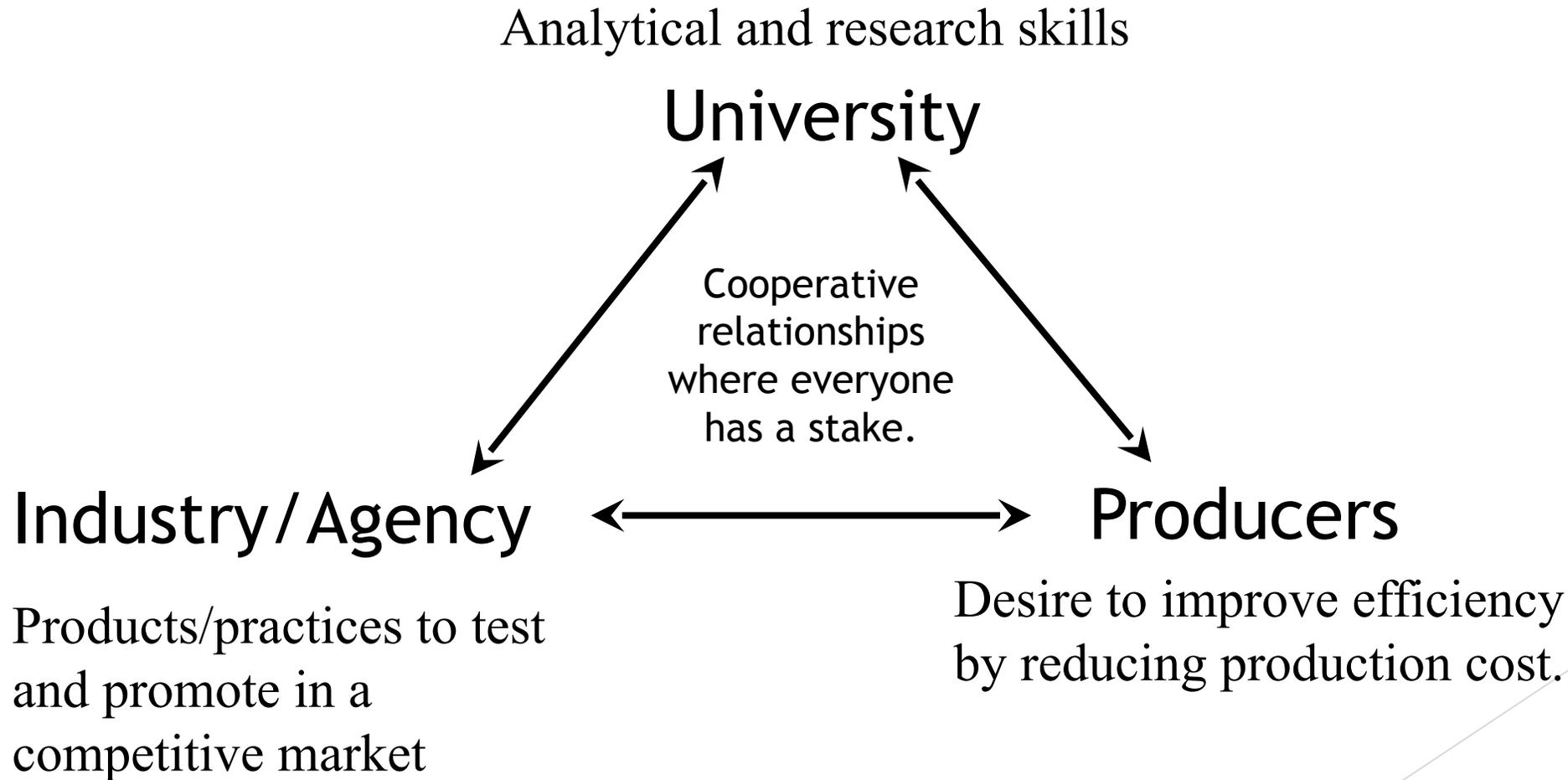
Agriculture Connectivity --- Land-Grant Mission fit in this illustration?



Courtesy of Dr. John Fulton

Image courtesy of New Holland

Partners in Research Model



BIG Data

- ▶ Continuation of (Bleeding) leading edge of technology.
- ▶ Coordination of collection/analysis of Big Data.
 - Big Data leads to Small Decisions
 - Small Data leads to Big Decisions
- ▶ Where will KARTA be in this movement?
 - Ag in general is along for the ride
 - Do you want to drive the process? Think KFMA

Great Moments

GENERAL SESSION - EAST BALLROOM

8:30 Using GPS Data to Influence Machinery Decisions – Randy Taylor, Ag Engineer, Kansas State University

- ▶ “That’s just plain crazy!”
- ▶ “Now you’re just pole vaulting over mouse turds.”
- ▶ Marketing skills (defined as “repeatedly getting higher prices for your production”) are a fiction.
- ▶ The growth of many people with the ability to get up in front of a crowd and make a presentation.
- ▶ The look on researchers’ faces when some farmer questioned their r-squared value.
 - Where the hell did that come from?

Old Time Poster Session

