REACCH
Regional Approaches to Climate Change –
PACIFIC NORTHWEST AGRICULTURE

Virtual Precision Ag. Field Day

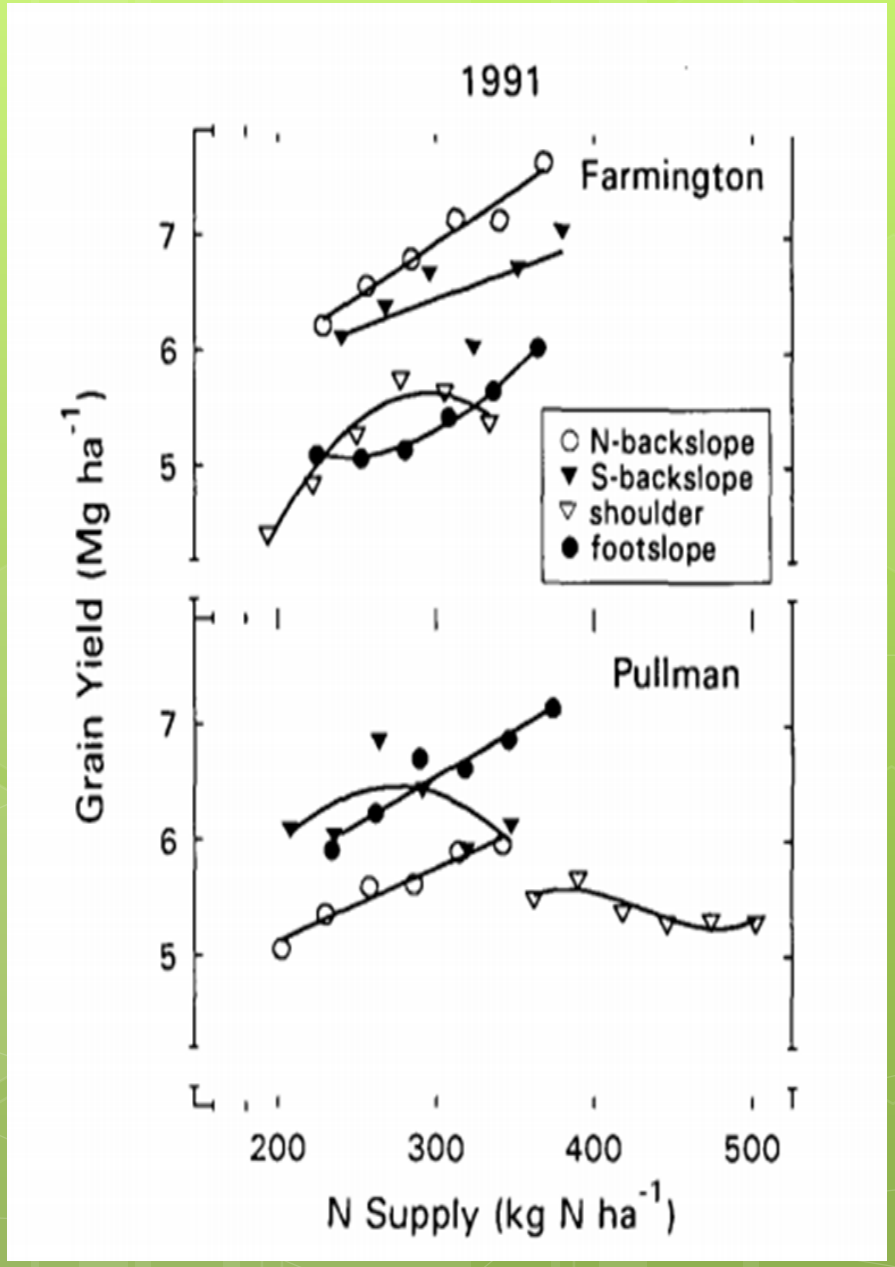
AllisonMay Buiser

August 5, 2014

REACCH Extension

Image: Plant et al. 2000 California Agriculture 54:4

Variability in the region



Variations in grain field

- Loss of Organic Matter
- High Clay = High bulk density
- Reduced water infiltration
- Reduced plant nutrients
- Reduced beneficial biota

Feiz, Miller and Pan, 1994

Precision Agriculture

or site-specific farming

- Addresses field variability by targeting management practices and addressing specific needs in that field.

- Growers can effectively:
  - Save $$
  - Improve yields
  - Reduce unwanted environmental effects

Types of technologies

- Precision Ag Software
- Tractor, Seeder Drill
- Auto-boom
- GPS guidance
- Rate Controller
  - Sections
  - Individual units
- Variable Rate Applicators
  - Fertilizer
  - Seed
  - Spray

- yield monitors
- aerial imagery,
- tech, which detects the amount of chlorophyll, crop health and weeds

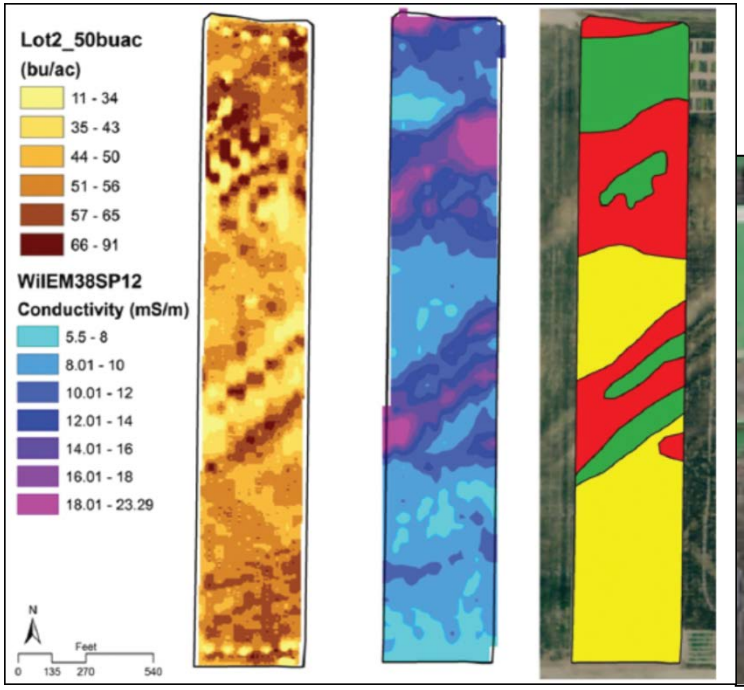
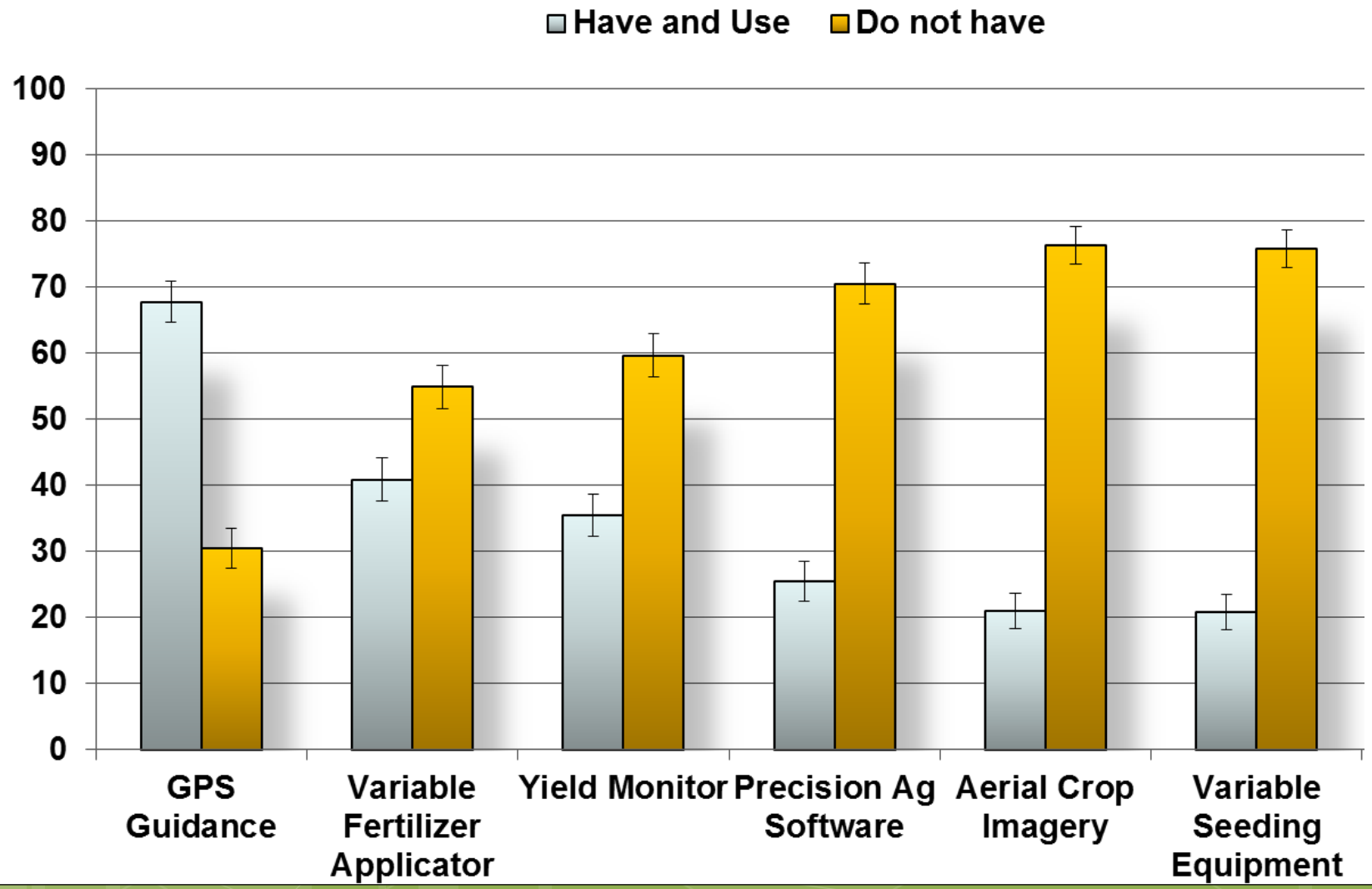


Image: Dave Huggins

Image: Guy Swanson

Use of precision agriculture technologies by wheat-based producers in the inland PNW



Wulfhorstd, Bernacchi et al., in prep

Precision Agriculture and Climate Change

- Reduced reactive nitrogen in soil
- Nitrous Oxide (N_2O) emissions
- Greenhouse Gas
- **75%** of US N_2O emissions from Ag

- Reducing inputs can reduce natural gas and GHG emissions from
  - -Manufacturing
  - -Transport
  - -Equipment passes over a field

Goal

- Identify meaningful up-to-date information about precision agriculture farmers can take into consideration?

Objective

- narrow gap between developers and users
- synthesize meaningful findings regarding precision agriculture to date.

Hypothesis

- Growers interested in precision agriculture have difficulty with time to *alter their practices, managing new equipment and providing financial support.*

Materials

- Footage of Field Day Precision Ag. in June
- Voice recorder
- Literature
- Specific interview questions

Method

5 Researchers specialized in precision ag.

Questions:

- area of focus
- zones
- accessible findings
- confidently recommend

Method

- one practice
- one technology
- information from growers
- producers do on their own

Results

- zones : **2-3**
- accessible findings: **crop color**
- confidently recommend: **consultants are recommended**

Results

- producers do on their own: **yield monitor**
- one practice : **Yield map**
- one technology: **Auto-boom & remote sensing**
- information from growers : **Soil Health (pH)**

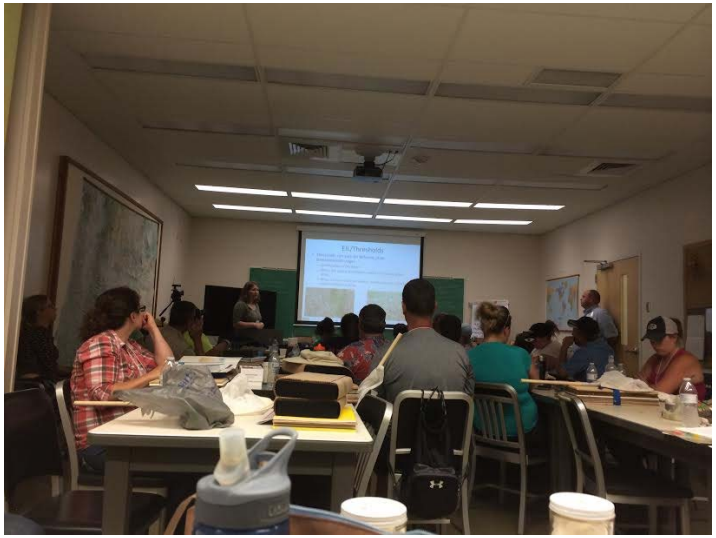
Conclusion

- Have a goal, stick to it
- “Evaluate, Evaluate, **Evaluate**!”
- Be careful and be patient for data
- Industry also needs to be careful
- Be true to your complications and the **willingness to commit**
- Family member interested in technology
- Video tutorials
- Global Positioning System (GPS) technology is required

Further Recommendations

- Room for climate change **education** in Industry
- More **growers participants** at Field Days
- Combine Extension workshops with Teacher's Workshop
- Farmers input: "variable herbicide applications"
- **Highlight successful growers** that use PA-case studies

Teacher's Workshop 2014
Pendleton, OR



Education

Extension

Useful Resources

Aubert, Benoit, Andreas Schroeder, and Jonathan Grimaudo. "IT as Enabler of Sustainable Farming: An Empirical Analysis of Farmers' Adoption Decision of Precision Agriculture Technology." *Elsevier* (2011): 510-18. Web. 18 Aug. 2012.

Huggins, Dave, Jake Wavrin, Aaron Esser, and Kate Painter. "Precision Nitrogen Management: Developing Science-based Practices." *REACCH Annual Report* 3 (n.d.): 22-23. Web.

Mulla, David. "Twenty Five Years of Remote Sensing in Precision Agriculture: Key Advances and Remaining Knowledge Gaps."*Elsevier* (2011): 357-67. Web. 13 Sept. 2012.

Video courtesy: Leigh Bernacchi

Special Thanks!

- Kristy Borrelli
- Interviewees
- Georgine Yorgey
- Chad Krugen
- Leigh Bernacchi
- Jodi Johnson-Maynard
- USDA
- REACCH Interns
- Marijka Haverhals
- Sandford Eigenbrode

USDA United States Department of Agriculture

Questions?

Image: Carolyn McCotter