Topics

• Cell phone apps
• Unmanned aerial systems (UAVs)
• New seed hoppers & tubes
• ‘Real time’ harvester tracking
Cell Phone Apps

• Many growers now have smart phones that give access to many useful tools including apps
• Many different categories
  – Weed identification
  – Fuel usage
  – Perimeter measurement
  – Plat book

Precision Laboratories Mix Tank App
Cell Phone Apps

• Ag staff has identified a list of useful apps
  – Listed under the agronomy section of the Crystal website in agronomy tools
  – Please let the staff know of other apps that you might use so we can add them to our list
  – List availability for both Android and iPhone platforms
Cell Phone Apps

App List will be located in Ag Tools
UAVs

- Very big topic in the agricultural community
- Can take pictures and video with GPS reference for use in GIS programs i.e. Ag Data Viewer, ArcMap
- Possible uses
  - Field scouting
  - Spraying
  - Yield predictions
  - Field drainage
  - Many others as well
Types of UAVs

• Two main types that come in all sizes and designs
  – Multicopter
    • Many rotors
  – Fixed wing
    • Looks more like traditional aircraft
    • Predator and Globalhawk systems
Types of UAVs

- Multicopter
  - Hover
  - Simple to operate
  - No runway needed
  - Low endurance
  - Usually just video not pictures
  - Cannot map a whole quarter section
Types of UAVs

• Fixed Wing
  – Used for mapping
  – Longer endurance
  – Faster forward velocity
  – Hand launched
  – Landing challenges
  – More affected by wind

Fixed wing UAV flown in St. Thomas, ND over a rhizoctonia research plot in 2012.
Visible vs. Infrared
St. Thomas ND Field
Future for UAV

• Regulations
  – FAA Modernization and Reform Act of 2012
    • Requires a plan to be develop for UAV integration by Sept. 2015
    • Until rules are passed through Congress model airplane and research are the only legal means of operation

• In Japan UAV’s already spray fertilizer and herbicides over farms

• “Unmanned aircraft holds tremendous potential for North Dakota and will provide new opportunities for agriculture, education and border security,”
  – Rick Berg, former US Congressman
Precision Planting Readies Metering System and New Seed Tube

- Precision Planting announced (Jan 2014) that it is developing a "retrofittable" multi-hybrid metering system that uses vSet meter technology and the new vDrive electric meter control system to allow for instantaneous switching between hybrids as a planter moves from zone to zone.
'SpeedTube' means faster planting

- According to Jason Stoller, Precision Planting Engineering Product Manager for the new SpeedTube, time for planting is limited, and larger planters aren't the answer for larger farms.
- "Planting speed is limited by the constraints of the seed tube, because high speeds lead to poor spacing," he explains.
- The SpeedTube will control the seed all the way from the meter to the furrow.
- **More testing** is needed to evaluate the performance of the tube on the planter test stands and trials
Real Time Beet Harvester Tracking

- Concept: Actively track ‘real time’ harvested acres to provide valuable information to decision makers in ACSC and on the farm

Source: E. Harnisch and K. Knapp 2/2014
Why Real Time Beet Harvester Tracking?

• Help manage the “lag time” in managing at risk acre decisions

• ACSC and growers have significant costs associated with a harvest disruption
  – Employee retention

• Potentially better quality beets if decisions can be made more timely
  – Less mud
  – Less frost

• Help to better manage space at piling sites
  – Pile heights based on real time harvest information
Real Time Beet Harvester Tracking

• Many precision Ag companies are interested in real-time harvested acre tracking
• Many different concepts of how to implement a system (wireless unit, plug and play)
• We have met with two companies that have a functioning prototype tested in the RRV
  – Pulsar Operational Boundaries, Inc., Eric Harnisch – VP
  – Tierra Plan, LLC, Kevin Knapp, CEO
Proof of Concept Approach

• Worked with a Crookston grower to track harvested acres
• Used different types of equipment with different types of data transmitting abilities
• Integrated the GPS and GIS web platform for data analysis and visualization
• Wanted to keep equipment and mounting simple
Harvester Monitoring Home Page

Key Information
- 9 parcels - xxx acres
- GIS Layer for beet fields
  Color coding available
- Yellow fields go to Crookston station and pink/red to Eldred

Source: E. Harnisch and K. Knapp 2/2014
**Key Information**

- 12 row harvester progress shown
- 6 row harvester area high-lighted in orange-open area
- Note: 12 row did 2/3 of the harvesting & 6 row 1/3

Source: E. Harnisch and K. Knapp 2/2014
Lessons Learned

• Actively tracking harvest progress seems very reasonable with a few modifications in equipment and programming
• Some equipment transmitted data better than others
• GPS data points will need to be collected more frequently for better accuracy on odd shaped fields
Future Plans

• Determine outcome to achieve how it can be incorporated with what we currently do or where we want to go
• Look into a possible pilot project
• Use upgraded equipment that address problems encountered from 2013 concept project
• Continue to investigate different options for real time harvest progress reports
Questions?