**WERA 1022 Multi-State Meeting**

Annual Meeting Notes

**September 25, 2018**

Ed Kee, Former DE Secretary of Ag, Retired UD Vegetable Specialist – Guest speaker

* Introduced DelMarVa area and identified the Chesapeake Bay
* 1.2 mil acres of cropland across DelMarVa
* VA Eastern Shore has many wetlands and barrier islands
* Delaware
	+ 41% farmland (2,500 farms) with 24% permanently preserved
	+ 76% is in open space
	+ In 1950, 80% of land was in farmland
	+ Farm value high in chickens, vegetables, soybean, corn, greenhouse/nursery
* DuPont Highway was built by DuPont and turned over to the state in the 1920’s. This opened up agriculture opportunities
* Canning
	+ 1842 – 1st canning operation in Baltimore. They canned in-season fruits, vegetables, and oysters. There was lead used to seal cans. It was before pasteurization science, so it wasn’t always done correctly
	+ 1927 – Canned tomatoes were king, good way to get nutrition to rural areas
	+ Labeling was important for canned goods
		- Pictures on labels helped with marketing
		- Walt Disney designed the label for international shipping
	+ Operations became old, needed updating for environmental reasons, sometimes easier to shutdown instead. Canning decline in the area. Processing shifted to California.
* Poultry
	+ 1923 - Cecile Steele accidentally got 500 chickens and decided to raise them and sell them
	+ Within a few years, local farmers followed suit and grew to 10,000 chickens
	+ WWII increased demand for protein, also created black market due to government price control
	+ Nutrient management is strict
	+ Planting windbreaks around houses, helps with ammonia
* Irrigation
	+ Great aquifer in terms of volume
	+ 1973 – 20,000 acres with mostly hand-moved pipe for veggies
	+ 2019 – 150,000 acres of irrigation with center pivots, 5,000 acres of drip irrigation
	+ Increase in yield covered crops and mitigates risk
	+ Farmers use the DEOS system to understand ET rates and use the checkbook method OR just intuition, experience, and self-knowledge
	+ There are now models that estimate fungal disease based on estimations of host, disease, and environment

BREAK

*Business meeting*

* Ed Martin showed the NIMMS website and discussed reporting requirements
* Ed Martin showed Arizona’s weather network website AZMET
* Kevin Brinson showed the Delaware Environmental Observing System (DEOS).
	+ 57 stations in DE and PA (for rainfall that affects DE watersheds)
	+ Data used for:
		- Irrigation
		- Disease forecasting
		- Snow removal
		- Others
	+ Irrigation scheduling tool has forecasting added this year from NWS forecasting database
* James Adkins gave a summary of a sensor project
	+ 20 growers for 3 years, so 60 total, tried sensors
	+ Found that ET data was good enough
	+ Producers were not willing to handle the sensors on their own
	+ Used Watermarks with one set point and it worked well, matched KanSched
	+ Soil water storage is top 10-18 inches, sandy soils
	+ No water conservation issues, just nutrient and economics issues
* Gene Stevens
	+ From the bootheel of Missouri
	+ Irrigation app (cropwater.org) with 111 users, 454 fields in 2017
	+ Program went statewide in 2018 and numbers are up!
	+ Graduate student developed DD60 crop growth model was integrated into the app
	+ Restricted by the distance of the Mesonet, but working to allow manually added ETo
	+ Solar Radiation Index used to adjust. Multiple days of cloudy conditions with index <0.5 for 3+ days is a stress event
	+ Cotton irrigation, best yield at 18 inch root zone
	+ Furrow rice irrigation, best yield at 12 inch root zone, nitrogen losses looked at
	+ Looked at soybean NDVI, LAI, other weekly data on multiple maturity groups and varieties
	+ The new data will be used to add new features to the app
* Wei Ren
	+ Modeling development for 15 years, simulates hydrological and chemical changes
	+ MS River Basin, coastal systems
	+ Looks at transport from land to water, leaching
	+ Climate Smart Agriculture, soil health (cover crops, no-till, biochar)
	+ Recent interest in irrigation
	+ Trying to develop an optimum irrigation schedule for nitrogen input to protect agroecosystems by combining model with modern technologies
	+ Realizing that its an ideal idea, not realistic
	+ Has meterology network in ABE dept
	+ Will bring some new information next time to start discussing Kentucky specifically with extension agents

**September 26, 2018**

Mark Isaacs, UD Experiment Station Director – Guest Speaker

* Provided introduction to the station, history of the facility, and how UD is structured
* Explained how their funding works and why they operate in specific ways
* Successful because community funding was spent frugally and they were very responsive to the community’s needs

Gordon Johnson, Vegetable Specialist – Guest Speaker

* Disease forecasting
	+ Sensors were not reliable, so they moved into weather information
	+ NEWA Potato Disease Forecast
	+ MELCAST for Watermelon
	+ Cucurbit Downy Mildew risk information
	+ Delaware Downy Mildew Lime Bean Risk Tool
* Insect Emergence
* Planting temperature
	+ Weather stations give a starting point, but doesn’t give field specific temps. They also need to go out and measure it.
	+ UD produces temperature tables that predict emergence percentage and number of days from planting to emergence
* Growing degree days (crop maturity)
	+ Tests varieties to verify seed company information
	+ Tenderness reading for peas
* Irrigation scheduling
	+ Provide estimated ET tables, related to temperatures and expected weather conditions
	+ Checkbook method
* Pesticide application
	+ Discussed dicamba drift
* Frost and freeze warnings
* Drought monitoring
* Heat monitoring
	+ Correlate high temps with plant responses
	+ High temps cause blooms to drop and cause other issues
* Long term weather use example
	+ Processing plant utilization
		- Historical growing degree day data to determine planting dates for different locations
		- Looks at 30 year running averages – maybe 15 year is sufficient
		- Determine changes in planting dates and irrigation requirements
* Recent projects
	+ In-field weather monitoring of mostly temp, RH
		- Lima bean heat tolerance
		- Root knot nematode
	+ Long term environmentally-sensed data for climate warming
		- Rising min temperatures most troubling, but max temperatures are also increasing
		- Extreme temperature events
	+ Targeted heat mitigation – mulch, radiation blocks, reflective materials, shade, regulators, root inoculants
	+ Adaptive heat mitigation – crop changes, planting season, genetics

*Business meeting*

* Vasudha Sharma
	+ Groundwater areas of concern connected to highly irrigated areas
	+ 20% of farmers use checkbook method
	+ Farmers indicated they don’t like the excel spreadsheet
	+ Very limited ET and crop coefficient information
	+ Start of extension includes ET gage network, SMS irrigation trigger levels, move to smart apps
	+ Future projects – Irrigation Management Assistant (IMA) Expansion
* Vivek Sharma
	+ Wyoming has low annual precipitation (12.7 in) with high ET (46 in)
	+ Spatial and temporal variability in precip and ET
	+ 1.54 Mil acres are irrigated in the state
	+ 85% of total consumption is irrigated agriculture
	+ Wyoming is a headwater state
	+ Primarily surface irrigated with increasing sprinkler irrigation
	+ Current research
		- Irrigation, nitrogen management on sugar beets
		- Screening dry bean genotypes for drought tolerance
		- SMS – testing multiple sensors and working on calibration curves now
		- Dry bean water management under sprinkler and surface irrigation
		- ET research - Measuring ETc and Kc for different crops, BREBS
		- Developing WACNet weather network
* Stacia Conger
	+ Showed where irrigated agriculture resides in the state
	+ Developed Kc’s for cotton on sandy clay loam soils using soil moisture sensors
	+ Developed irrigation scheduling spreadsheet and checked it against 2015/2016 data. Need to add infiltration to it.
	+ No progress on state weather network