USDA-ARS Agricultural System Competitiveness & Sustainability
Customer Workshop
February 22, 2012

<u>TOPIC QUESTION 1:</u> What knowledge or technology would improve our abilities to produce an agronomic crop in systems that are profitable and will ensure environmental stewardship?

Please capture what you feel is important to share with the group in post-breakout report & discussion.

Summary of topics below:
Research needs:

- Water management issues for the rain belt: crop water use – initiation/termination, timing, amount, irrigation scheduling, irrigation systems, improve water use efficiency for irrigated production; sensing systems; application systems;
- Water management through production practices e.g.: cover crops, tillage, mulches, rotations, planting dates, row width, germplasm/crop genetics; heat resistant corn to better handle high temperatures;
- reduce consumptive use of water for agriculture, create drought and heat tolerant crops
- Economic variable rate technologies within a span (spray rig, irrigation, etc); economically based control within a boom system
- on-the-go sensors to detect insects on the go for variable rate control (VR pesticide application)
- Organic volatiles – to detect plant stress
- Systems of crop production (e.g., how to manage cover crops with respect to tillage), Data integration, standardized data (precision agriculture).
- Integrate future "ag" technologies quicker into recommendations including variety, nutrient management, herbicide technology, system components, precision agriculture.
- Technology stewardship/seed technology
- Seed treatment/Bee concerns
- Evaluate industry products, Field scale validation: pest management, precision Ag., genetics, create methodology to validate on-farm new technologies compare to current system(s),
- Biomass crops, nano technology, tracking for technology,
- Peanut conservation system adoption
- Technology transfer vs. research needs
- nematodes – control/resistance – breeding for resistance
- improving soil quality under challenging conditions
- alternative options for the entire system
- aflatoxin – all crops, but esp peanuts and corn

<u>TOPIC QUESTION 2:</u> What knowledge or technology would improve our abilities to produce specialty crops in systems that are profitable and will ensure environmental stewardship?

Problem with "specialty" crops definition – all crops are just as important. Don't distinguish

- Marketing Research
- BMP's from "conventional" production integrated into specialty crops.
- How specialty crops integrate into whole farming systems:
- Rotation, off target site, management of pests and pesticides.
- peanuts – seed breeding
- genetics for disease resistance
- Techniques on Marketing fresh fruits and veggies or locating markets – marketing coop structures; how to establish markets for small farmers;
- Cover crop legumes that will perform well in high pH soils
- How weather impacts system
- How size impacts management

<u>TOPIC QUESTION 3:</u> What knowledge or technology would improve our abilities to produce crops and livestock from integrated systems that are profitable and will ensure environmental stewardship?

- knowledge of impacts and mitigating practices and costs to go into integrated system
- information on year-round production of fields (what works and what doesn't)
- use everything and not let anything go to waste – creating energy from chicken litter. Is energy production
- business/production specialization issues (i.e. cattle vs. crop producers)
- also include bioenergy into system
- animal manure and distribution to alleviate importation of fertilizers (N, P and K). concentrate manure so freight is less and spreading is easier – manure distribution integration and application (where it's produced vs where it's needed)
- manure (BL) reduction in volume and improved application technologies
- systems to make distribution and use of manures economically feasible – methods of injecting or converting (through energy) to other uses
- Fertility and manure management. How integrate manure management into production systems
- Grazing cover crop management: Animal science and cover crops (agronomics).
- Decision metrics for integrated Ag. Systems
- BMP's and integration recommendations include economics.
- Poultry and livestock integration

<u>TOPIC QUESTION 4:</u> Wildcard for each Area.

- Biofuel from biomass
- Robotics
- Economics driven of Southern cropping system future prediction (rotation crops vs. biomass).
- Alternative cropping systems
- Farm scale (system) economics
- Loss of pest management technologies (Temik, Roundup: alternative choices
- Vulnerabilities/ backup systems
- Interagency coordination
- Outreach component – needed, but can't be extension
- Type of outreach beneficial? Young farmer groups – concentrate here, more receptive
- Deep-rooted crops or cover crops such as sun hemp or bahia grass to scavenge nutrients dep in the soil – how bring P and K to surface for better uptake and use? As cover crop or rotation – introducing alternative crops or cover crops to better utilize the system
- Not only technology, but also government policy changes to help meet food challenges – more production on each acre with less inputs – need to target maximization on each acre, but need motive to do it. Currently, no incentive to growing multiple crops – need to have a reason to bother growing crops. e.g. wheat at $4. Reduce inputs and improve use efficiency; good stewards of inputs and resources available
- Alternative input sources – nutrients, energy, to create intensive agriculture system
- Cover crops – adoption issues, such as water availability, time to perform operations; integration into current system; cover crops that can be harvested and sold to pay costs of producing; exploration of new cover crop species and systems; alternative rotations e.g. main crop in winter and summer cover crop production.