Cropping system improvements and innovation session

Paul Fixen, International Plant Nutrient Institute
Nutrient stewardship innovations for increased cereal system resilience

John Kirkegaard, CSIRO
Cropping system management variables and effects on C, N, and water across production zones: Australian perspective

Bram Govaerts, CIMMYT
Increasing productivity in rain fed, semiarid systems by analyzing and remediating limiting factors
What are the principal gaps and opportunities for linking efforts in this area to the others covered in the breakout sessions?

Alternative system design principle: *Stacked management*, (like stacked genes of variety development) approach for enhancing resource use efficiency (multi-year and pre-crop)
Partnerships with a focus on actors and participants; upside down extension model
Indicators and analytics to answer “how are we doing?” through a decision making (and evaluation) cycle
G(enetics)*E(nvironment)*M(anagement)
broad thinking, integrative innovations
Whole systems approach (not just talking about working with a department in another college, but everyone in the value chain, e.g. bankers) to model risks faced by growers (personalized)

Partnerships in which growers prioritize research and extension needs

Reward for non-disciplinary goals, transdisciplinary team playing
Factoring in soil storage (i.e. soil organic matter) into assessments of multi-year efficiency metrics

Are bare bone inputs/outputs enough?

Do we need to include microbes and soil quality in our resource use efficiency assessments and management?
De-convolute aggregate data to tease out mechanisms, impacts of site specific system alternatives
What sorts of short and long-term activities could promote the needed collaboration and integration?

Value long term field research for modeling
What sorts of short and long-term activities could promote the needed collaboration and integration?

—Question: what is holding back the adoption of conservation agriculture?

» Ease of entry: adopt technology

» Need flexibility in how we practice conservation management—“stacked management tools in various combinations”

» Judge success of CT on several scales
  - One year yield and economics
  - Rotation
  - Economics of ecosystems services “who’s paying for the future?”
Thank you!