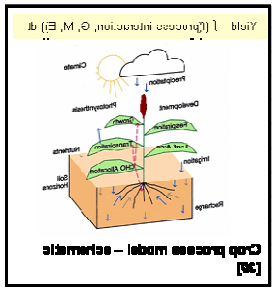
Task III - Complex Traits and G-to-P Modelling Summary of Discussion

- Opportunity exists for using models to support molecular enhanced breeding
- Modelling can play a role in understanding basis of complex traits and enhancing phenotyping as well as evaluating complex traits via simulation of putative mechanisms in the TPE
- Effective gene-to-phenotype linkages using models will likely involve connecting genotype-driven and phenotype-driven approaches
- Clearly defined questions/targets involving testable hypotheses are required
- Integrated approaches involving breeding programs in the research process are needed

Task III - Complex Traits and G-to-P Modelling Summary of Discussion

- Attention to science in models should focus at process level not model level but model development in this way needs to be far more rapid to link with plant breeding
- Investment in a process/toolkit for sharing and capturing learnings among modelling teams is needed
- We suggest subsequent investment in one/two comprehensive integrated case studies connected to breeding programs with sufficient capacity

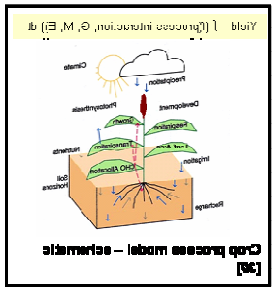


Task III Discussion
III Making Connections – Which Model for What?

Cryptotype – a virtual genotype expressing an unobservable phenotype in an artificial simulation *(dictionary of GCP-WPM)*

Rec? - If GCP want to get serious about this approach, then we should suggest a focus on one/two really good integrated case studies.

- If not then we develop a project for crytoptype improvement!



Task III Discussion
III Making Connections – Which Model for What?

- Issues
  - model as hypothesis testing vehicle or hypothesis development vehicle for g-to-p link? (good to visit the hypothesis graveyard!)
  - is nesting of models at various levels of detail needed for effective g-to-p link? Informing vs hard-wiring?
  - is it more effective to phenotype to link model coefficients directly to QTLs or to use models more heuristically to guide more integrated phenotyping and search strategies?
  - how can we use models based on incomplete knowledge in a "learn-as-you-go" mode via hypotheticals and minimse the "crap model" risk?
  - can we make better use of cryptotypes?