

## Regenerative Agriculture: Curriculum Development

### Topic Areas

1. Regenerative Agriculture
  - What is it?
  - What does it mean?
  - How do we get there?
  - Placing agriculture in an ecological context
  - Creating resilience by changing the system
  - Impact on the consumer as part of the food-energy-water nexus
2. Need for food security/nutritional security
  - Population trends
  - Changing demand
  - Nutrition and relationship to health and well-being
3. Soil functions
  - Overview of the functions of soil
  - Biology-Chemical-Physical aspects of soil
4. Soil biology as the foundation to regenerative agriculture
  - Role of soil biology
  - Diversity of soil biology
  - Fragile nature of soil biology
5. Nutrient cycling –Chemical processes
  - Major nutrients
  - Micronutrients
  - Role of amino acids
  - Role of water soluble carbon
  - Addition vs cycling
6. Hydraulic processes within soils- Physical processes
  - Infiltration
  - Storage
  - Availability of water
  - Interaction with plants
7. Gas exchange in soils
  - Carbon dioxide
  - Oxygen
  - Greenhouse gases
  - Importance as part of regenerative agriculture
8. Genetics
  - Differences in genetic response and interaction with soil
  - Phenotypic differences
  - G x E x M interactions
9. Integration of water, nutrients, and gases
  - Cropping systems
  - Rotations

- Tillage
- Cover crops
- Spatial and temporal variation in responses due to the soil and weather variation
- 10. Enhanced plant performance
  - Productivity vs quality
  - Metrics for assessing performance
  - Water use efficiency
  - Nutrient use efficiency (all nutrients)
  - Radiation use efficiency
  - Linkage to environmental quality (water and air quality)
  - Profit
- 11. Support for regenerative agriculture would derive from the participants, field demonstrations, training sessions, and formation of regenerative ag groups.