

## Critical competencies for BFR Education in Environmental Management

We identified many concepts, but recognize that the specific competencies related to each concept will be dependent on the type of operation and geographical location. Where some fairly universal competencies were identified in our discussions, they are listed, but this is not comprehensive. We envision that this information could be used in a self-assessment for beginning farmers and ranchers to identify strengths and deficiencies. Ideally this assessment would be linked to educational opportunities. A farmer/rancher is directed to advanced materials where they exhibit high competency and vice versa. We also recognize that there is likely to be overlapping competencies between some of the concepts.

### Science Concepts:

In this section, we often brought up the USDA NRCS acronym of “SWAPA+H” which is soil, water, air, plants, animals + humans. Understanding the basic science in each of these areas is a prerequisite for evaluating information sources and making environmentally-sound management choices.

- Soil science/soil health
  - Competencies: soil sampling, interpreting soil test reports, biological, chemical and physical properties of soil
- Water quality and quantity
  - Competencies: identify water quality issues of local, regional & national importance, identify ag connections to these issues
- Air emissions (including greenhouse gases)
  - Competencies: identify air quality issues of local, regional & national importance, identify ag connections to these issues
- Plant science
  - Competencies: Basic plant anatomy, growth, reproduction, nutrient uptake, taxonomy
- Animal science
  - Competencies: Basic animal anatomy, growth, reproduction, nutrition
- Food safety
  - Competencies: Recognize potential risk areas for on-farm contamination of foods

### Production Concepts:

Almost every activity on a farm or ranch has potential environmental ramifications. This level of scrutiny or detail can be overwhelming, especially for a beginning farmer or rancher. The group felt it was important to keep an eye on the “big picture” when identifying important concepts & competencies.

- Pest & disease management (plant & animal health/productivity)
  - Competencies: selecting appropriate control products at appropriate rate/dose
- Nutrient management
  - Competencies: Nitrogen cycle, developing a nutrient budget, calculating appropriate fertilizer/manure application rate, balancing ration to meet animal needs
- Grazing management
  - Competencies: calculate stocking rate and stocking density
  - Appropriate recovery periods for plants and grazing strategies for improving soil and animal health
- Production efficiency
  - Competencies: calculate product produced per unit of input
- Animal handling, stress, welfare

- Even though animal welfare is not directly related to environmental management, the general public and consumer often use this as a proxy. Farmers/ranchers who appear to abuse animals or treat them inhumanely are also viewed with suspicion regarding their environmental management choices.
- Irrigation management

## **Management and Economics Concepts**

At all stages of the discussion, group members felt strongly that environmental stewardship was not mutually exclusive with profitability—quite the opposite. Environmentally sound management decisions often can lead to greater profitability.

- Regulations, policy, rules, liability
- Documenting & communicating stewardship efforts (record keeping)
- Quality management; systems management
  - Competencies: identify monitoring points & criteria
- Emergency planning
- Marketing opportunities related to environmental impacts
- Enterprise Analysis to determine cost of production and profitability of enterprise (this is somewhat covered in production efficiency but not quite and isn't under the economic concepts)
- Environmental/Economic Analysis to determine how increased soil fertility is reducing input costs and increasing production.

## **Communication, advocacy, public relations**

A common thread in discussions is that farmers and ranchers need to be aware of how the public perceives their farm or ranch and to be proactive in communication and community involvement.

- Awareness of public perception
- Involvement in community
- Development of guiding principles (mission statement?) that includes a section on environment
- Develop a whole farm plan that addresses farm/ranch relationship with the resource base in which it functions (including environmental outcomes)