Nutrition Management Strategies

- Soil testing
- Tissue testing - comparing to known standards - do they match ex. indeterminate tomato?
    - 2018 survey
    - pruning strategies
- Cover cropping
- Alternative carbon sources
- BMPs for HT nutrient management AND irrigation, include soil types, geographic regions

Plant Physiology

- Thresholds in extreme temperatures - unexpected heat injury, chilling injury in tunnels
    - temperature extremes OR
    - rapid change in diurnal temperatures
- Thresholds for humidity
- How to measure temperature & humidity in tunnels - for research - for growers
- Economics of adding heat to

Irrigation Strategies

- How to make irrigation decisions
- Overirrigation, wastes water but also leads to excessive humidity in the tunnel and waterlogging that leads to damage to soil esp. with hardpans, muck soils
- Mechanization/automation
- Surface drip versus subsurface drip
- Water quality - salt, sodium, sediments, chemical pollution, high alkalinity “pH creep”
- BMP for managing bad water quality, reclaimed water
- Integrating irrigation strategies with soil type
    - Physical property measurements, particle size, mineral composition
    - Soil release curve

Construction & Ag Engineering

- Tunnel design
- Extreme weather
- Passive/Active ventilation

Season Extension/Manipulations of Microclimate

- Planting/harvesting schedules
- Heat Sinks

Crop Production

- Variety Trials
- New Crops/Crops grown outside of their geographic range
- Planting schedules

Consequences of Continuous Production

- Soil borne pests – steam sterilizing – anaerobic soil disinfestation
- Salt, salt stratification
- Insect pest carry over
- Duration of fallow periods e.g. aphids starting on winter greens…then moving to tomato?

IPM

- Managing GH pests with augmentation biological control
    - Temperature limits/timing of applications
    - Supplemental heating effects
- Insectary plantings & conservation biological control
- Integrating chemical & biological controls
- Pests unique to tunnels

Participatory Research (develop a network of growers who are interested in participating)

- represents a diversity of growing systems - crowd source data on successful planting schedules, nutritional management approaches
- facilitates technology transfer
- avoid blindspots in adoptable practices
- mother/daughter trials, taking on risk before asking a grower to try it

Emerging Technologies

- New tech that's adoptable or in development
- Decisions support tools
- Other regions of the world

Economic impacts of particular practices/systems

Factors influencing grower adoption of practices/systems

If we became a research project…

What kind of research questions could we answer over a broad geographic range?

What kind of research questions could we answer over a broad timeline (5-10 years instead of 2-3 years)?

What kind of infrastructure/facilities improvements would you need at your institution to carry out these broader research questions?