Planning and Siting for Hoophouses

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Overview

• Site Considerations

• Structure Considerations

• Pre-Construction Preparations
Terminology

- **Hoophouse** – Structure glazed with polyethylene (greenhouse plastic) that is used to extend the growing season.

- **High Tunnel** – Same as hoophouse. Term used to emphasize importance of low tunnel use inside high tunnel.

- **Greenhouse** – Typically a more permanent structure, often with supplemental heat.
Why Consider Season Extension?

- Extend the growing season
- Increase marketing/cropping opportunities
- Increase revenue per square foot
- Increase crop quality & yield
- Enhanced environmental control
- Reduce incidence of plant disease
- Protection from weather (i.e. frost & hail)
- Labor efficiency (work regardless of weather)
Site Considerations

• Light & Shade
  • Orientation

• Drainage

• Access, Utilities, Future Expansion

• Wind & Snow

• Stationary & Movable
Light & Shade

- Light is essential for growth - maximizing light will directly impact yields
  - Photosynthesis
  - Heat
- Many things impact light transmission
  - Location
  - Season
  - Material selection
- Orientation of Structure
  - Wind
  - Snow
  - Light
  - Ventilation
Light & Shade

• Shading from other structures
  • 2x height = distance from structure
  • Most essential in fall-spring

• Bed orientation/tunnel orientation
  • Depends on cropping plan:
    • Tall crops vs. Short Crops
Drainage

- 1” of rain on 1500 ft$^2$ = 935 gallons of water

- Water must move away from the structure during rain/snow melt
  - Avoid saturation/flooding of interior soils
  - Limit freezing in winter months

- Options:
  - Swales
  - French drains
  - Rainwater collection
  - Ditches
Access, Utilities, Future Expansion

- Water will be necessary
  - Hoses vs. Hydrant
- Depending on use of tunnel, it may be important to have electricity or gas
- Future hoophouses?
  - Build with access to current and future structures in mind
  - Think about setbacks for multiple structures
Wind & Snow

- Snow
  - Must have enough space to clear away from structure
  - Must have structure that is strong enough to withstand local snowloads
  - Think about ventilation in spring/fall

- Wind
  - Use of windbreaks around structures
  - Prevailing winds and orientation
Management!
Stationary & Movable

• Depends on type of movable system
• Parallel and in the same plane (moving along length of structure)
• Utilities – access in all positions
• Drainage – effect on other positions
• Does moving require equipment? – access requirements
• Build in one position, move to next (soil preparation)
Structure Considerations

- Bracing
- Roof Geometry
- Ventilation
- Endwalls
Bracing

Types:
- Corner Bracing (Sidewall & Roof)
- Purlins
- Truss Kits

Considerations
- Steel thickness and diameter
- Attachment mechanism
- Hoop spacing
Note: Ensure hardware is installed so it will not come in contact with plastic.

Begin at Peak of Hoop 3 and Work Toward Corners

Install Using 2-3/8" Brace Bands And 5/16 x 1-3/4" Carriage Bolts
Roof Geometry

Quonset

Cathedral

Gable

Gothic
Ventilation

• Types:
  • Ridge
  • Endwall
  • Roof
  • Sidewall
    • Roll-Up
    • Drop Down

• Considerations
  • Weather – wind, rain, snow
  • Electrical access
  • Cropping plan (warm vs. cool)
  • Manual vs. automated
Endwalls

• Types:
  • Prefabricated metal
  • Wood construction

• Considerations
  • Longevity of materials
    • Wood vs. metal
    • Type of wood – rot resistance
  • Anchoring
  • Access
Pre-Construction

- Soil tests
  - A & L Labs - Indiana
  - Logan Labs – Ohio
- Cover cropping – easy prior to construction
- Addition of composts/manure and minerals
- Stale seed bedding
- *This is the time for drainage work!*
Questions?

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