Comparisons of Wheat Rust and Soybean Rust

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Wheat Rusts

Stripe rust

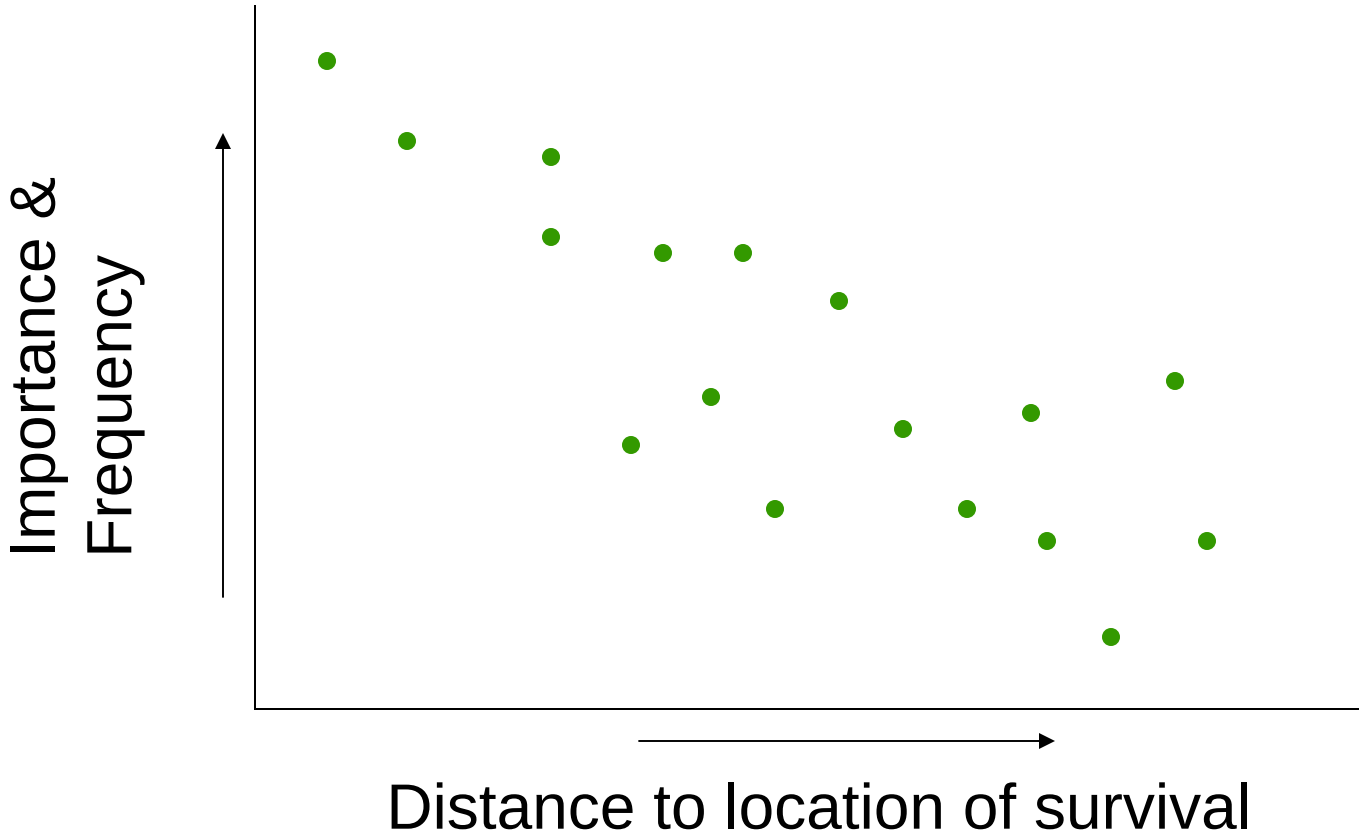
Stem rust

Leaf rust

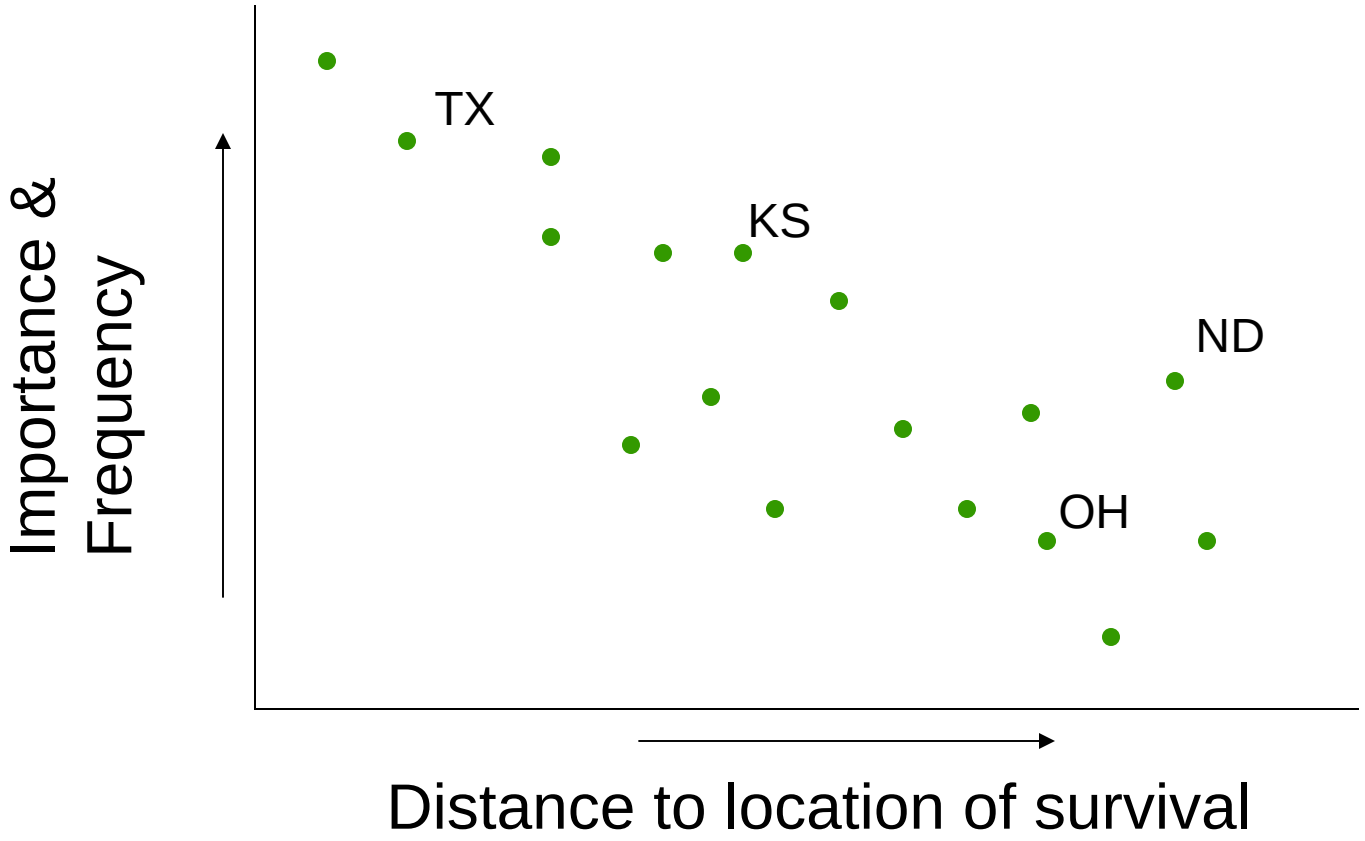
Critical Aspects of Epidemiology

- Extent of overwintering
- Potential movement into other regions
  - Timing of these migrations relative to crop growth and development
- Conditions for infection
  - Temperature and moisture as key drivers

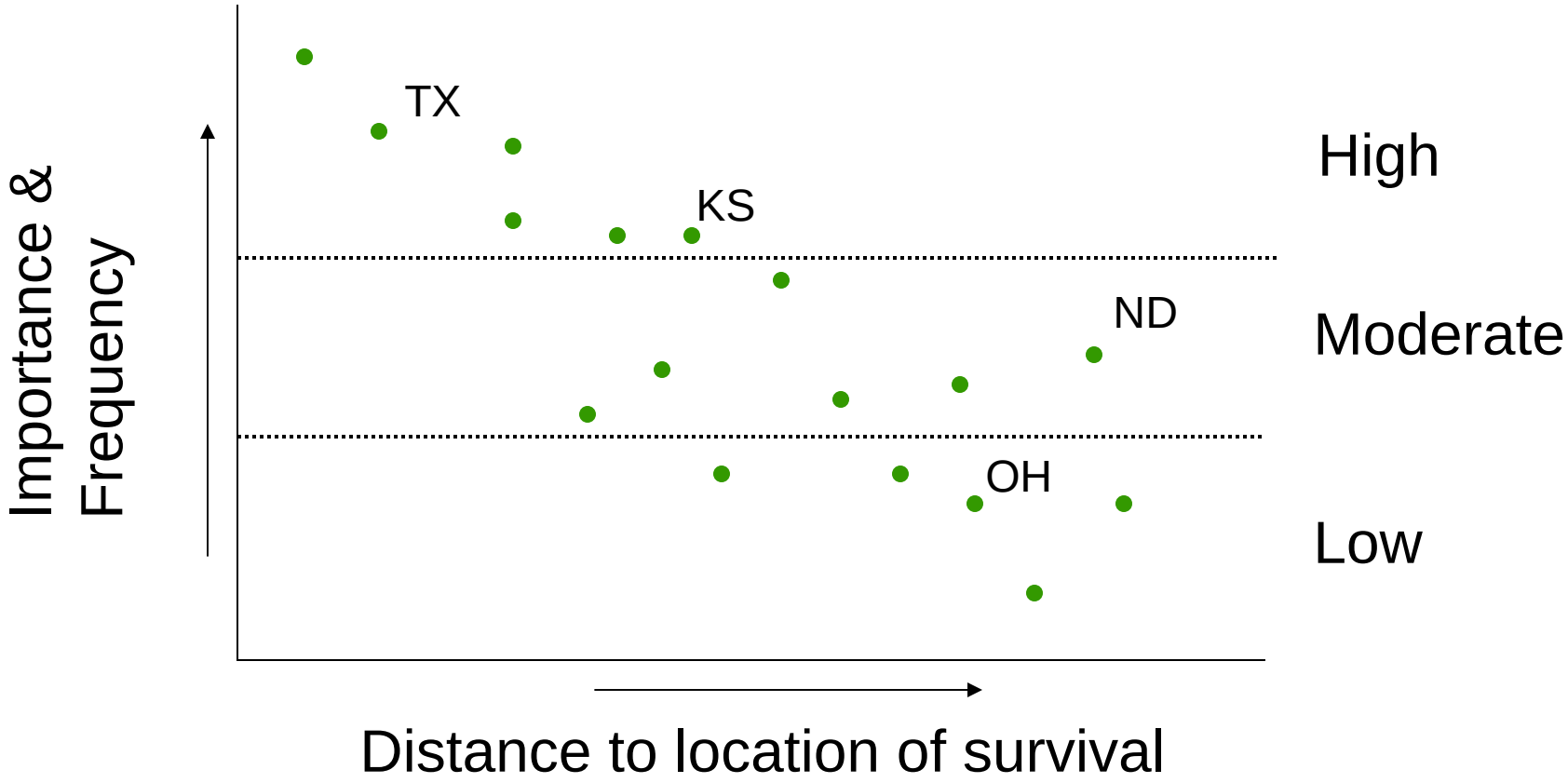
Perception of Risk



Perception of Risk



Perception of Risk



Useful Indicators of Risk

- Identifying regional sources of inoculum
- Finding channels of information

Cooperative Cereal Rust Monitoring

- USDA-ARS Cereal Disease Lab & USDA-ARS Pullman
  - Consistent survey paths each year
  - Monitoring pathogen populations (races)
- Land Grant Universities
  - Additional regions and more frequent monitoring
  - Focused on local management and regional risk
- Coordination and communication

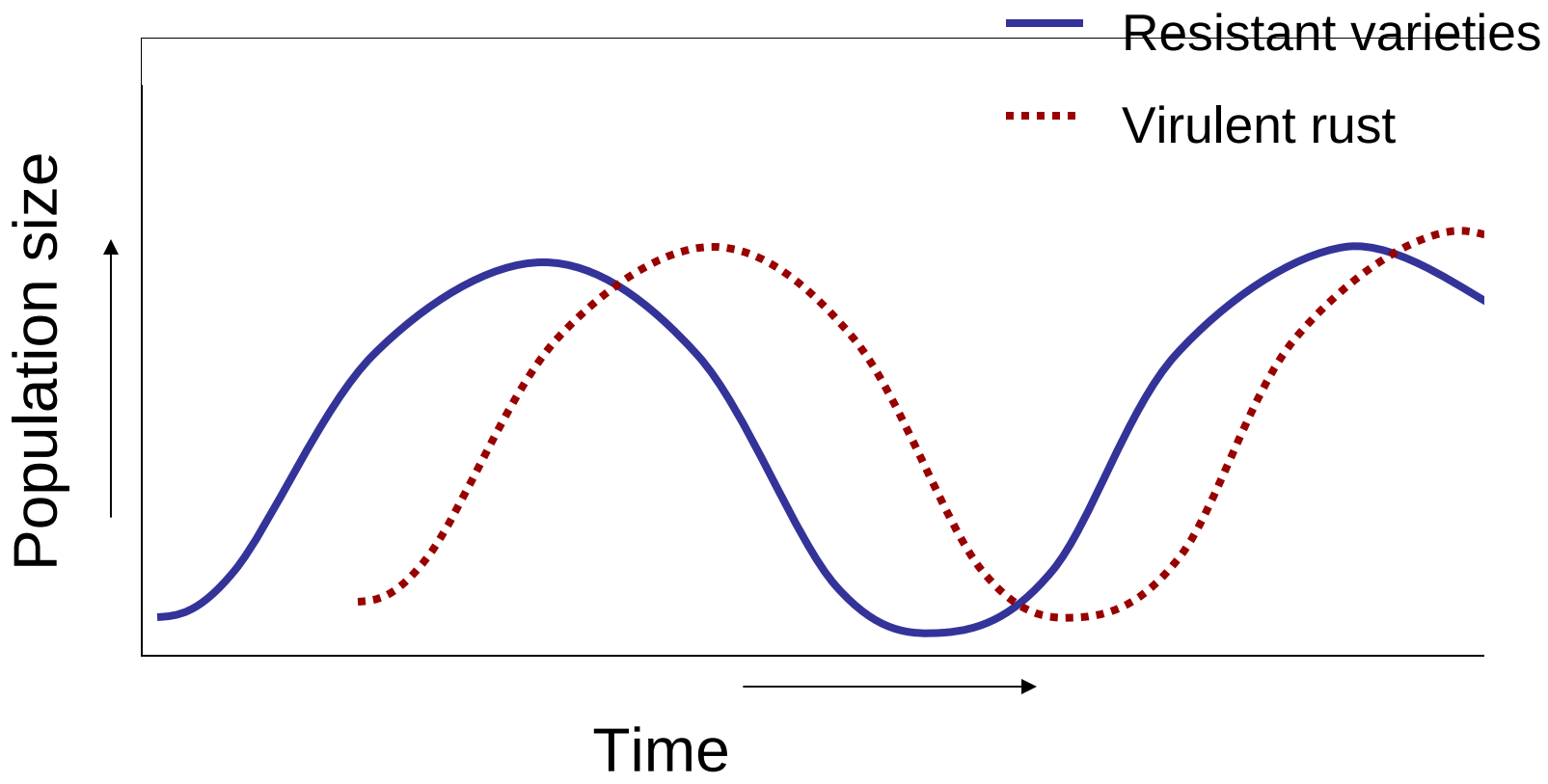
Modifiers of the System

- Acute regional environmental events
  - Freeze, heat, flood
- Variable adoption of management strategies
  - Chemical control
  - Deployment of resistance genes within a region

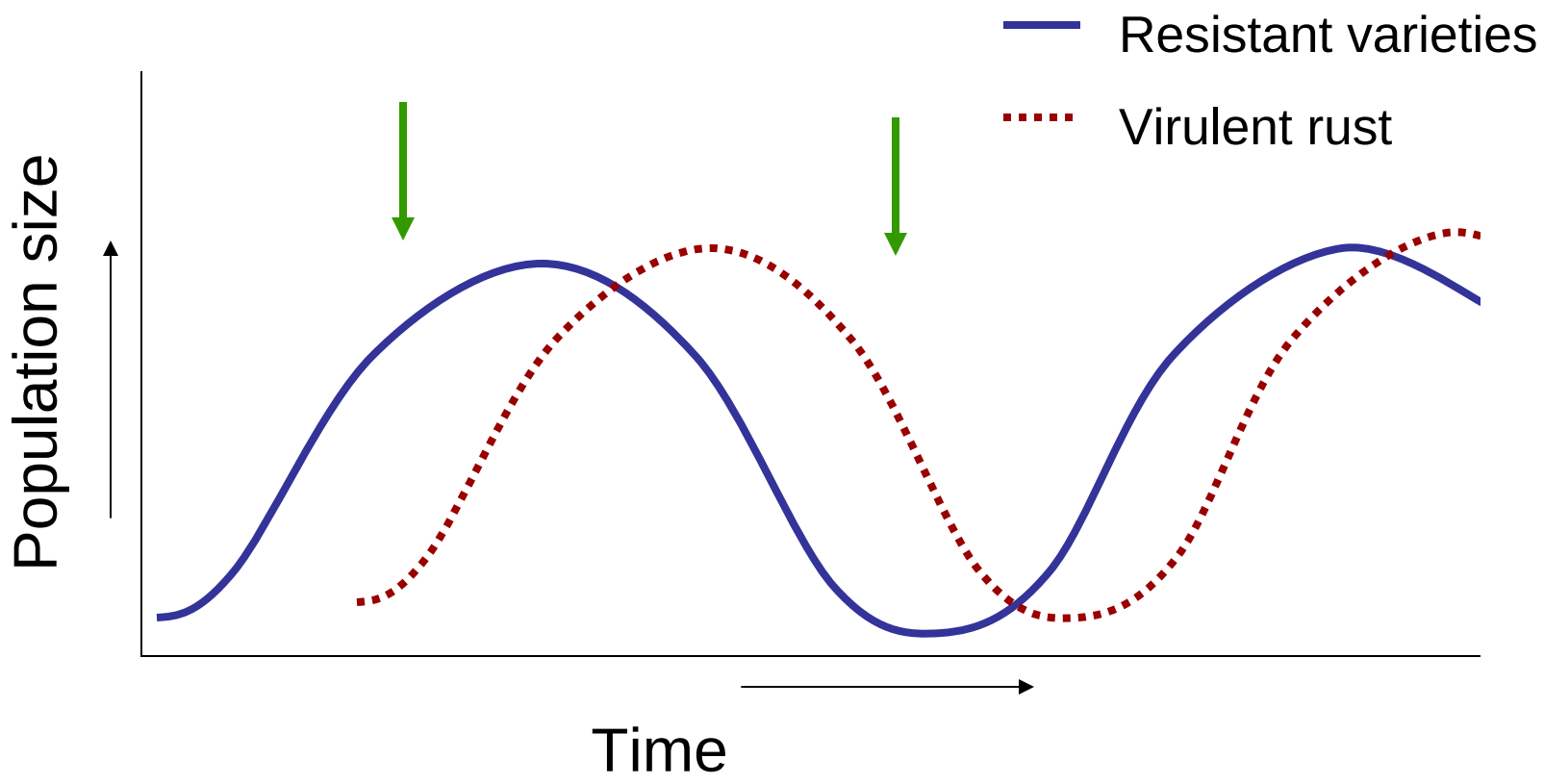
Recent Examples

- Freeze impact on grower priorities in crop management
- Impact of resistance on stripe rust in wheat
  - Uniform susceptible or resistant impact easily quantified
  - Variable adoption of resistance or life-cycle of resistance genes

Impact of Host Resistance



Impact of Host Resistance



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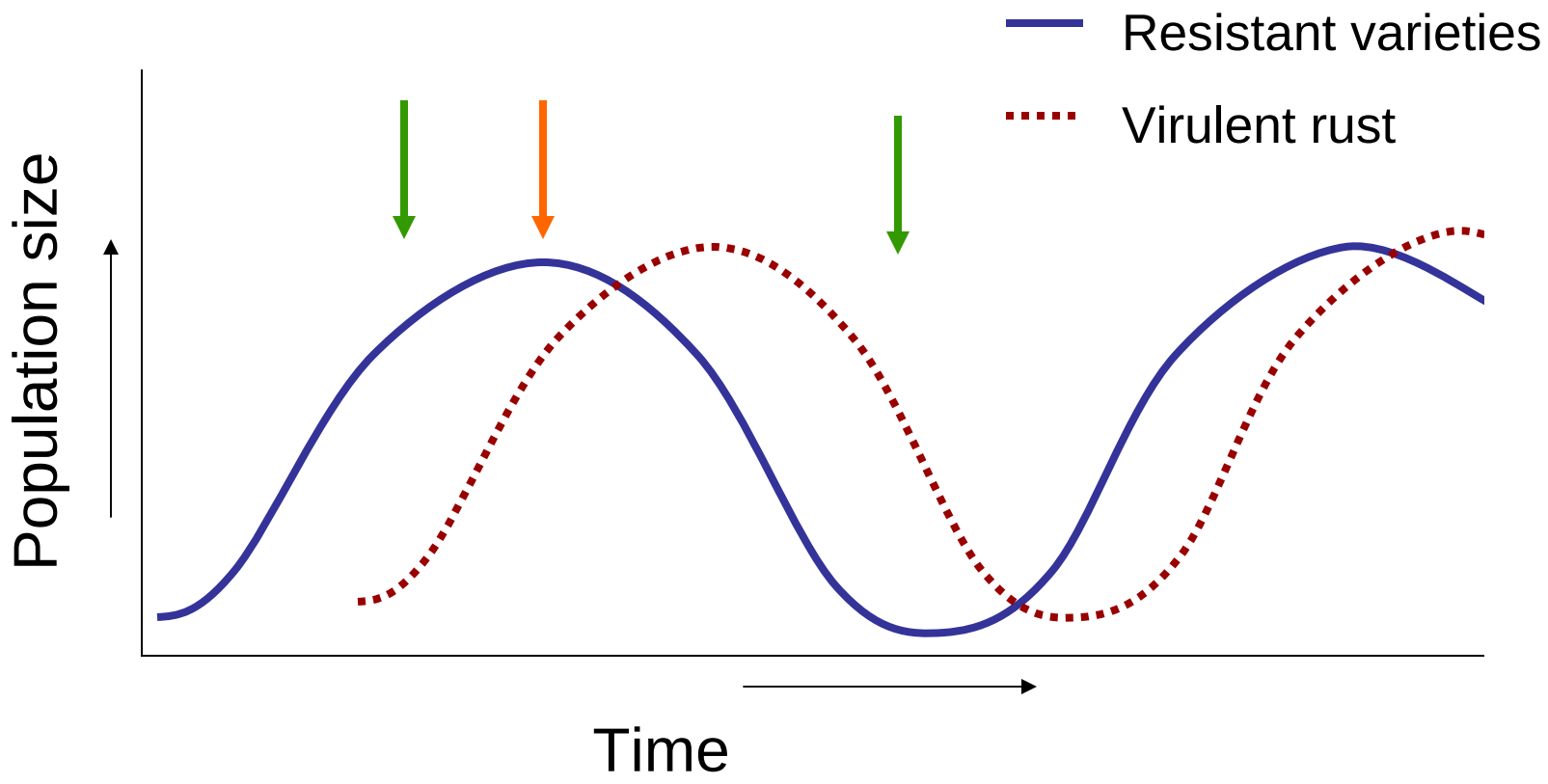

Closing Thoughts

- Soybean rust and wheat rusts have similarities in epidemiology
- Perception of risk is impacted by the biology of the systems
- Monitoring provides useful indicators of disease risk
- Indicators will likely be impacted by modifiers of the system