

# ALTERNATE SERVICE DELIVERY: U.S. SEED INDUSTRY PERSPECTIVE

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NAPPO Symposium: **Building on industry  
experience and best practices for efficient  
alternative service delivery**

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# Our History



*The American Seed Trade Association (ASTA) is one of the oldest trade organizations in the United States*

- Over 700 members involved in seed production and distribution, plant breeding, and related industries worldwide
- ASTA is a plant germplasm authority and advocates for science-based policy
- Members drive the agenda and identify issues relevant to the seed industry



# ASTA Mission

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*ASTA's mission is to be an effective voice of action in all matters concerning the development, marketing and movement of seed, associated products and services throughout the world.*

*ASTA promotes the development of **better seed** to produce **better crops** for a **better quality of life**.*

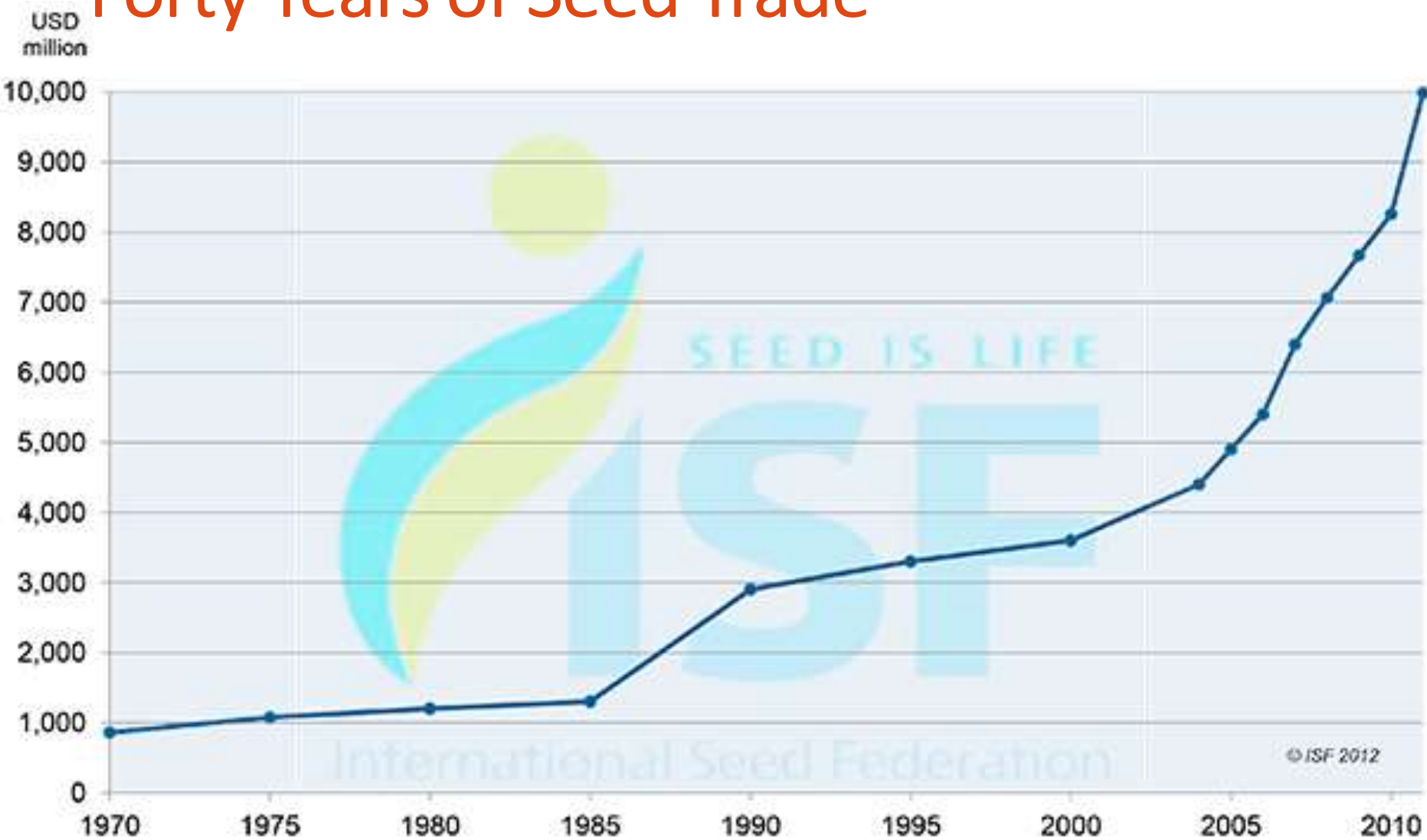


# The Seed Industry Is Global

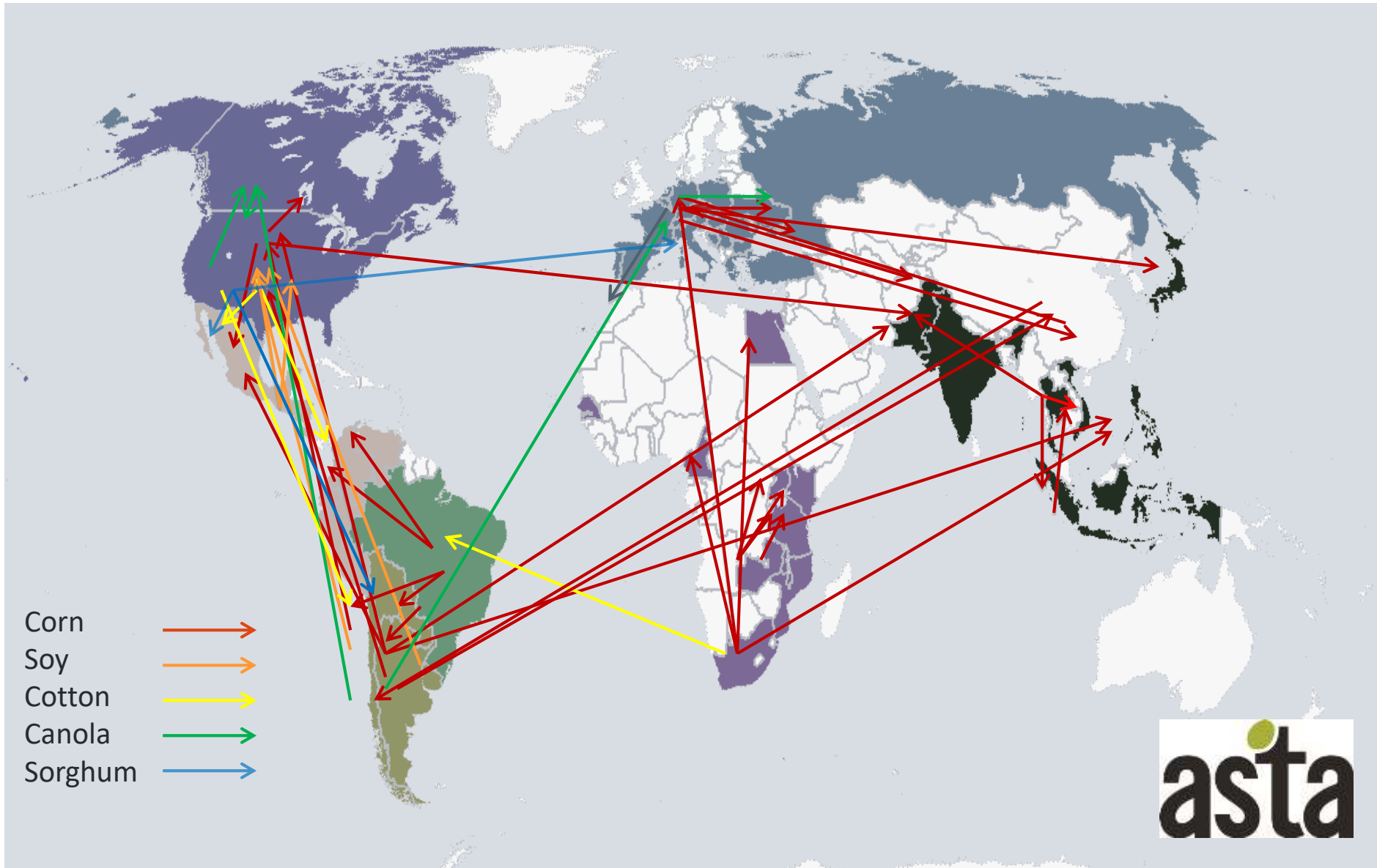
- \$45-50 Billion industry
- Many companies are now multinational; consolidations continue
- Seed exports, imports, and re-exports continue to increase annually
- Significant pre-commercial international movement of seeds:
  - Small lots (research and breeding)
  - Stock seed
  - Parental lines
  - Seed for increase



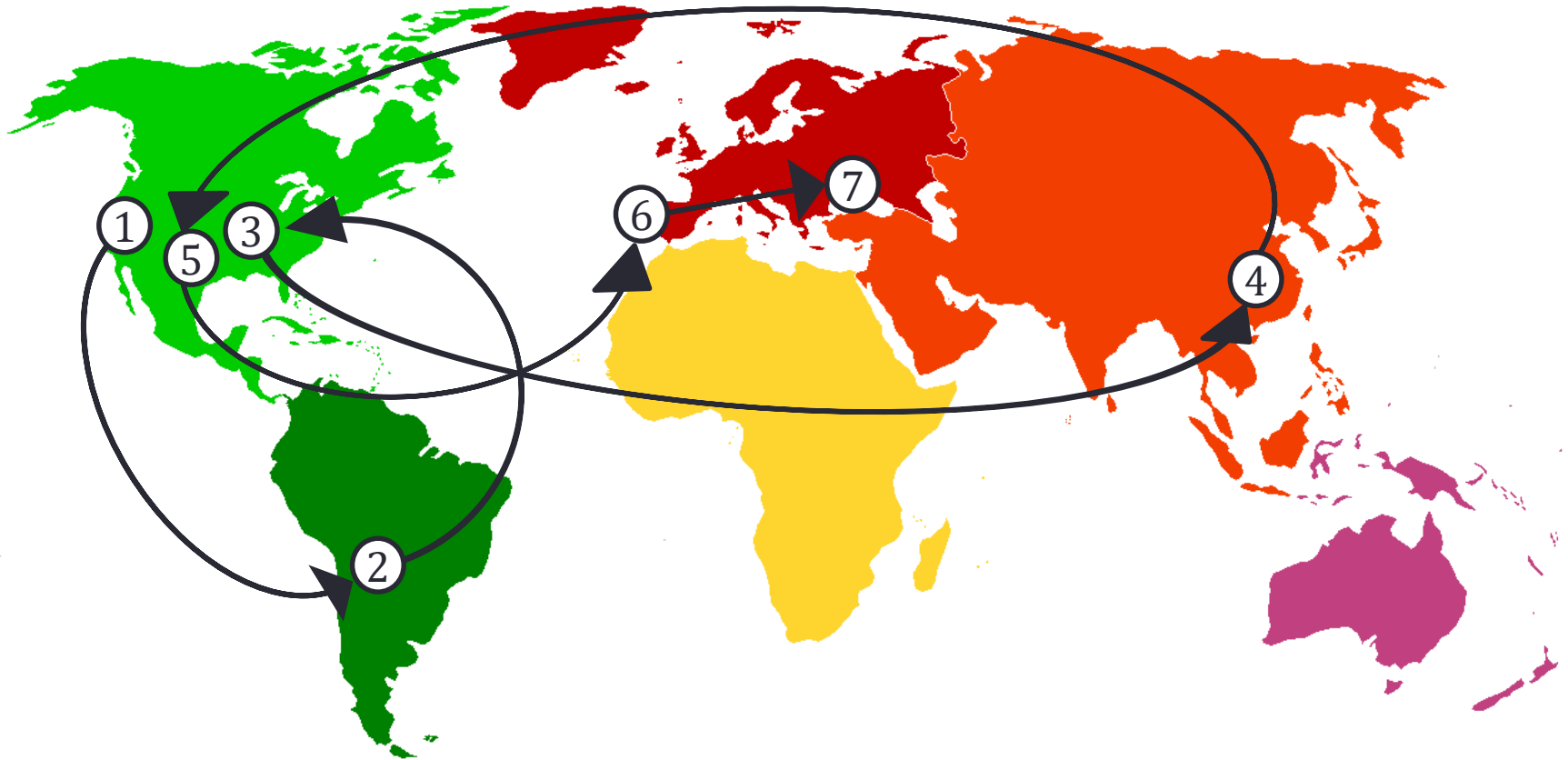
# Forty Years of Seed Trade



# Global Seed Flows



# Tomato Example



1. Basic seed or breeder's seed production in Country A.
2. Foundation seed production in Country B.
3. Stock seed production in Country A.
4. Commercial seed production in Country C.
5. Shipment of commercial seed back to Country A for cleaning treating and packaging.
6. Shipment to Country D for distribution.
7. Shipment to final destination after sale (Country E).

# Seed Trade Trends

- More concern about seed as a pathway
- More testing before shipment and upon arrival
- Mother plant testing replacing field walks
- Interest in developing accreditation systems





# Seed Trade Trends

- Technology is rapidly outpacing regulatory
  - Molecular-based (protein, DNA) testing methods have become ultra-sensitive and can cross react to closely related primers: is the pathogen there or not?
  - Novel seed treatments can kill/inactivate seed transmitted pathogens but molecular testing will show positive: is the pathogen dead or not?
  - Biological testing/validation methods are slow and sometimes complicated (bioassay)
  - Sample size needed for molecular testing too large for small lots
- NPPOs are often not aware of value of QMPs in phytosanitary risk reduction

# Best Practices in the Industry

- **Seed Quality** is a major driver – purity, germination, performance according to the label claims
- **Phyosanitary condition** is one aspect/component of seed quality
- Many of the same practices used to produce and validate quality seed also reduce phyto-sanitary risk

# EFFECTS OF SEED QUALITY MANAGEMENT PRACTICES ON PHYTOSANITARY RISK REDUCTION

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ASTA/USDA-ARS  
2016



# Goal

- “To develop a probabilistic risk-based model to assess the efficacy of seed quality management practices in reducing phytosanitary risks as well as enhancing disease control”
- Initially, the main focus is CMM (*Clavibacter michiganensis* subsp. *Michiganensis*) as a model system.

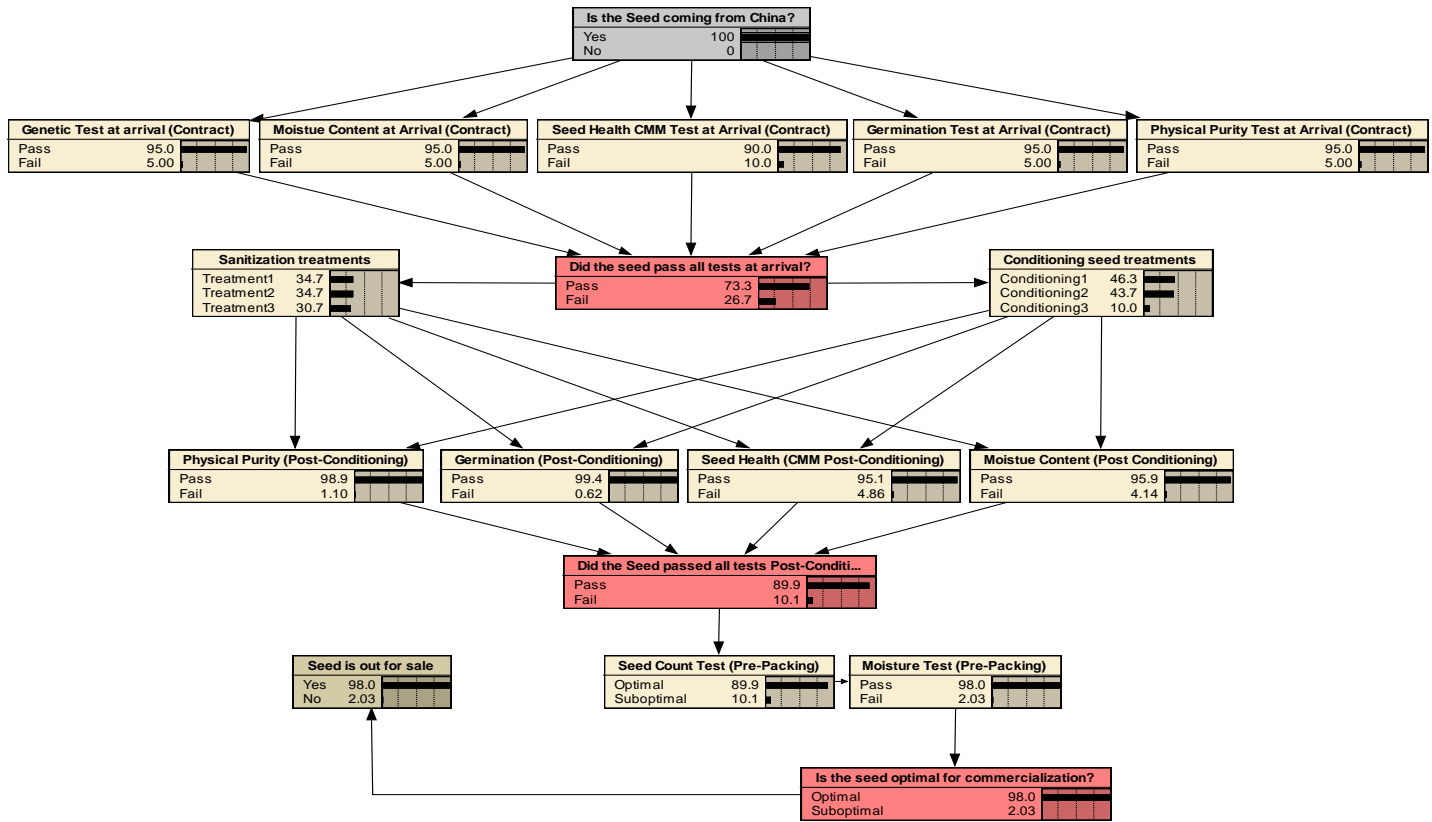


Photo: [www.osg.org/educacion/uadec/ins/Clavibacter/1.html#.VmjBk2FNaQ](http://www.osg.org/educacion/uadec/ins/Clavibacter/1.html#.VmjBk2FNaQ)

# Typical practices that can reduce phytosanitary risk

- **Use of quarantine (containment) systems such as greenhouses, screenhouses, isolation plots/fields**
- **Use of sanitation practices such as foot washes, sterilization of tools and equipment**
- **Selecting production areas where regulated pests do not occur**
- **Rogueing unhealthy plants**
- **Weed management practices**
- **Destroying infected/infested fields**
- **Seed cleaning/conditioning/sorting**
- **Seed Treatments**
- **Application of HACCP**

# Bayesian Belief (Causal Reasoning) Network



# Progress to date

- Researchers have conducted the first round (of three) of interviews with seed industry experts, analyzed inputs, and developed the final structure of the BBN:
  - Open field-produced seed
  - Greenhouse-produced seed
  - Tomato canker GSPP
- Identified three aspects of seed production process and how they interact:
  - Production operations
  - Plant operations
  - Seed health testing

# Ongoing Activities

- Researchers are working with seed company experts to capture information on all the components of the QM system and establish (quantify) relationships among the components
- Researchers continue to gather data from scientific literature.
- Targeted research to fill critical data gaps will be performed at Iowa State University
- A preliminary model will be presented at the ASTA Vegetable and Flower Conference (January 26-29, 2017 in Orlando)
- Next steps: test and validate the model; publish results
- Project runs through 2017





# Potential Impacts of this Research

**The results and model(s) derived from this project could become the general framework for alternative service delivery in the seed industry**



# Additional Considerations

- Too many pests, but few (internationally recognized) tests
- NPPO resources are limited (both for export certification and for mitigations at the POEs)
- New and better ways need to be found for NPPOs to maintain phytosanitary protection without adversely impacting trade
- Seed industry options: compliance vs. innovation

# Next Stages in the Evolution of Seed Phytosanitary Protection

- Seed ISPM
- Government-industry partnerships
  - **NSHAPP** (National Seed Health Accreditation Pilot Program)
  - **ReFreSH** (Regulatory Framework for Seed Health)
  - Evolve new/improved approaches to phytosanitary protection: systems approaches, more recognition of role of industry practices in phytosanitary protection/risk reduction
  - **Incentive-based accreditation** of companies that have documented QM/PRR practices in place



# Next Stages in the Evolution of Phytosanitary Protection

- **Evolve improved phytosanitary measures**
  - Improved seed phytosanitary treatments for seed transmitted pests
  - Non-destructive seed screening/testing methods
  - Streamlined PRA processes for seeds
  - Evolution of regulatory frameworks to take advantage of new technologies
  - ASD for seeds: certification of seed QM practices that reduce phytosanitary risk; accreditation of companies based on their QM programs and histories of safe trade; accreditation of third party providers; harmonization of ASD at regional (NAPPO) and international (IPPC) levels

# QUESTIONS & ANSWERS

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