

# Risk Based Sampling

NAPPO Symposium – June 2017 – Baltimore

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RBS Steering Committee Co-Chair



# NAPPO Steering Committee Members

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 Mexican Industry



**It takes a village....(2 years and lots of details!)**

**Logistics Team:** Melonie Torillo, Patty Murray, Pati Abad, Melody Maxwell, Joshua Robinson, Tracy Ayer, Don Seaver, Jean Davis, Steve Hadsell, John Ashby, Sofia Baez, Stephanie Bloem, Alonso Suazo, Rob Ahern (IICA)...

# Who attended?

- 123 total participants (48 from APHIS)
- 27 countries represented
- 4 USG Agencies (ORACBA; CBP; FDA; APHIS-PPQ, IS, LPA)
- 5 International Organizations (IPPC; EPPO; APPPC; IICA, NAPPO)
- 5 Industry organizations
- 4 Universities
  - UC-Davis;
  - Colegio de Postgraduados;
  - Univ. of Melbourne;
  - NCSU



# Objective of the Symposium



- promote harmonization
  - common understanding
  - shared experiences
- ...for the implementation of International Standards for Phytosanitary Measures (ISPM)
- Nos. 23 (Guidelines for Inspection) and
  - 31 (Methodologies for sampling of consignments).



# Why was the Symposium important?

- **Inspection most commonly used phytosanitary measure.**
- Many inspection designs are inconsistent with principles of safe trade.
- Conceptual background for inspection not well-understood.
- Information provided by inspection is often not as useful for risk management as it could be.
- Role of inspection in targeting requires development.
- Inspection designs strongly impact resource management.
- **Two ISPMs require support to be properly implemented.**



# What is inspection?



“Official visual examination of plants, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations.”

according to ISPM No. 5



International Symposium for  
**RISK-BASED SAMPLING**

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# Objectives of Inspection (ISPM 23)

- Detect pests that are present
- Verify effectiveness of measures
- Confirm compliance with regulations
- Detect organisms for which risk has not yet been determined
- *Provide information for improved inspection programs*



# What is RBS?

Risk Based Sampling is using statistical designs for inspection so that we are consistently detecting a defined level of infestation/contamination with a particular, known level of confidence.





# Important concepts

Inspection is **sampling**—involves statistical characteristics of sampling,

- **tolerance** and
- **confidence**

Inspection is

- based on a form of **acceptance sampling** (looking for a defect by sampling without replacement)
- which implies a **threshold** and **limits of confidence**



# Sampling design

## How much to sample

### Percentage sampling

- Fixed sample size
- Risk is only constant when lot size is constant
- Not technically defensible

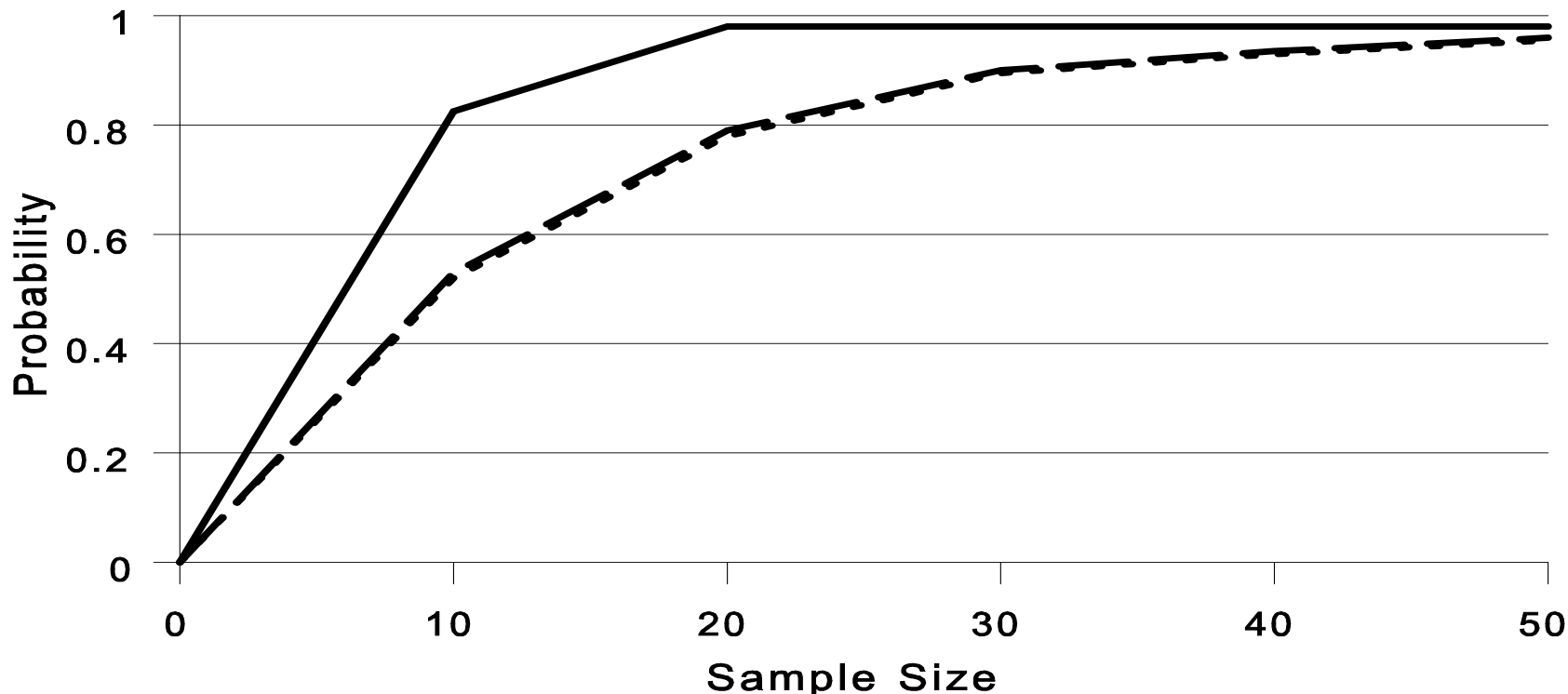
### Risk-based sampling

- Fixed risk
- Sample size varies with lot size
- Technically defensible



# Probability of Detection

(based on infestation rate of 1/10)



Lot size

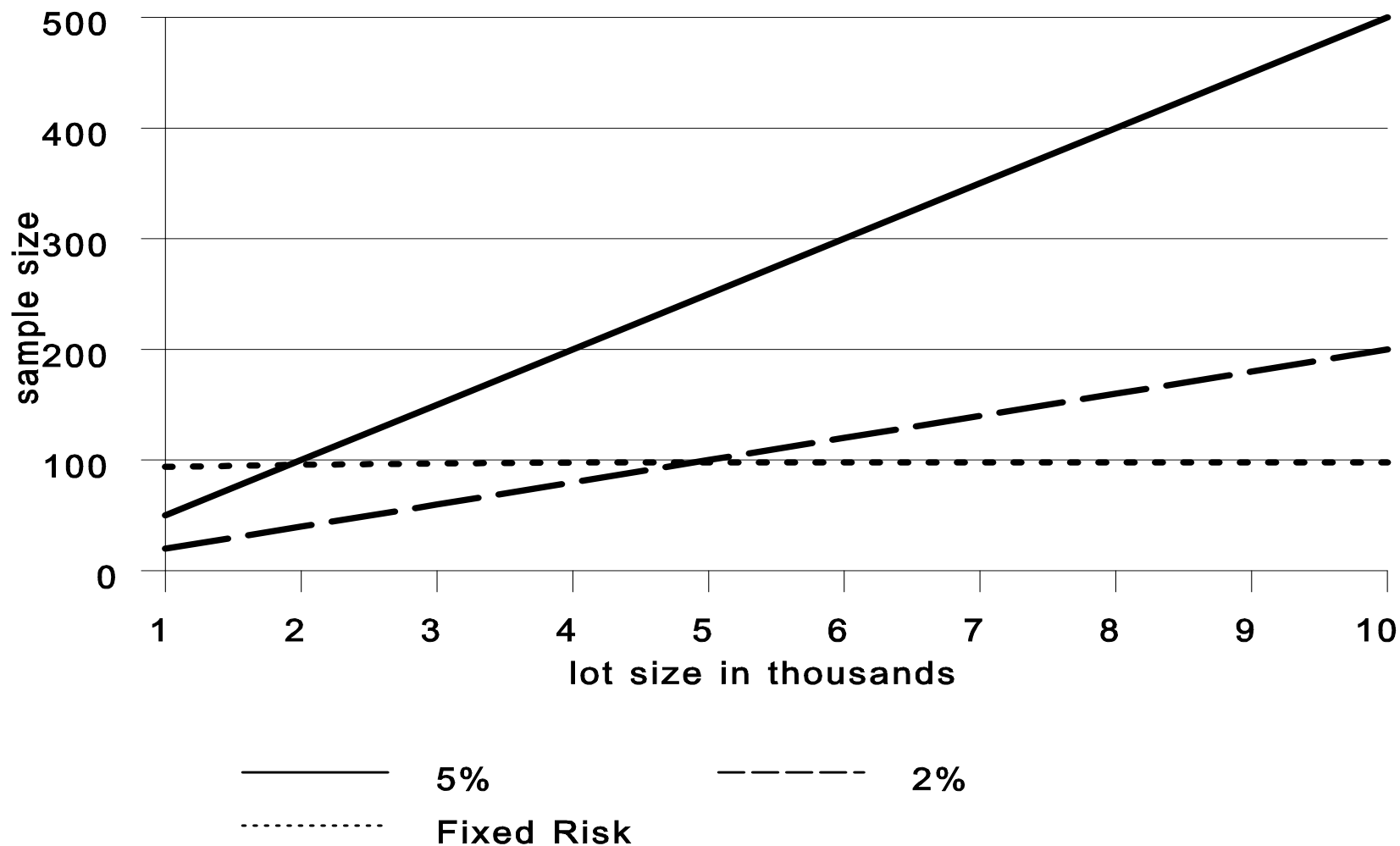
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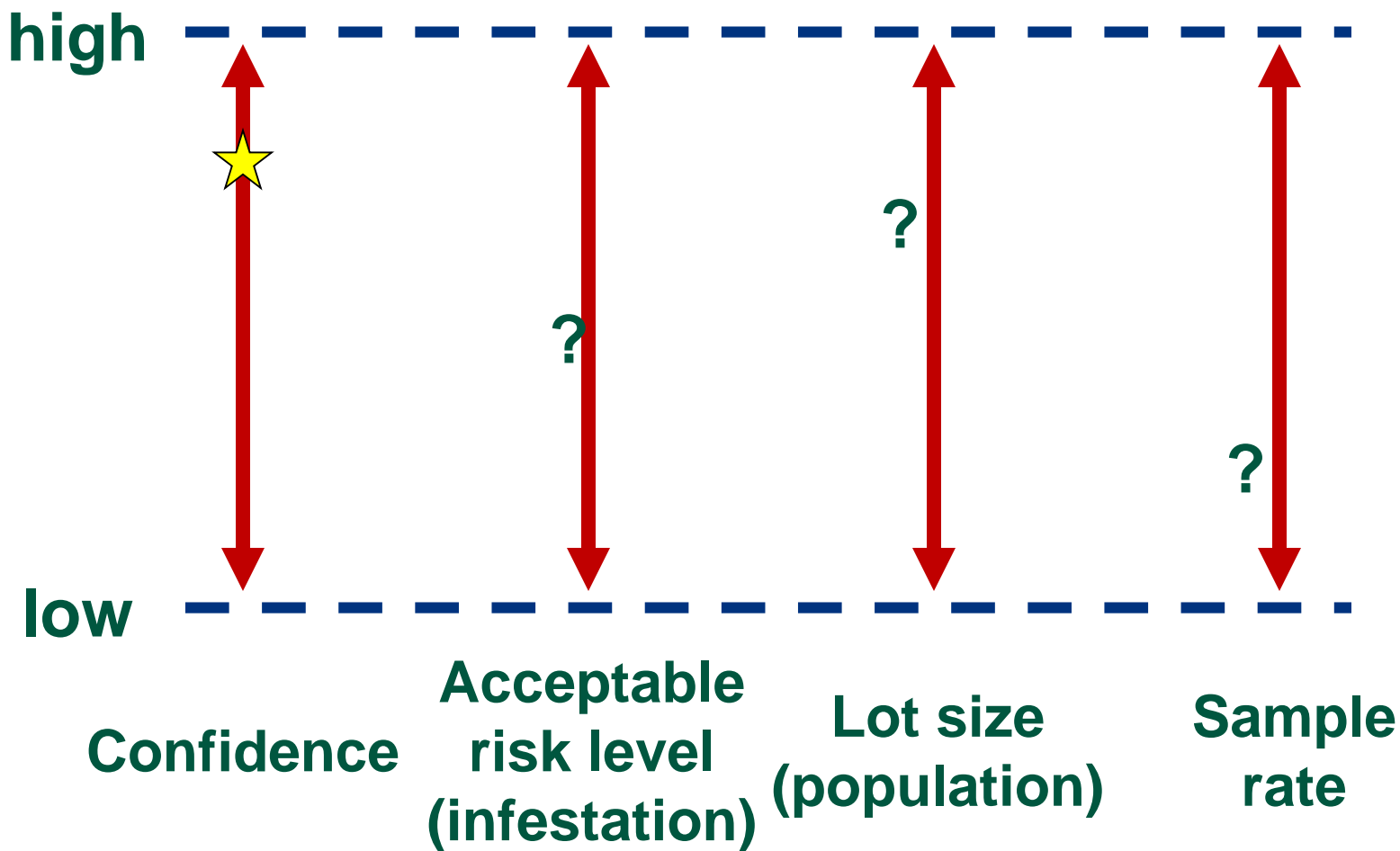
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# Sample Sizes

based on detecting 3% infestation with 95% confidence



# Sampling variables



# Sampling variables

- A **fixed sampling rate** results in variable risk as a function of variable lot size.
- A **fixed risk level** (infestation) results in a variable sample rate as a function of lot size.
- A **fixed lot size** allows both the sampling rate and the risk to be stabilized at a specific level.

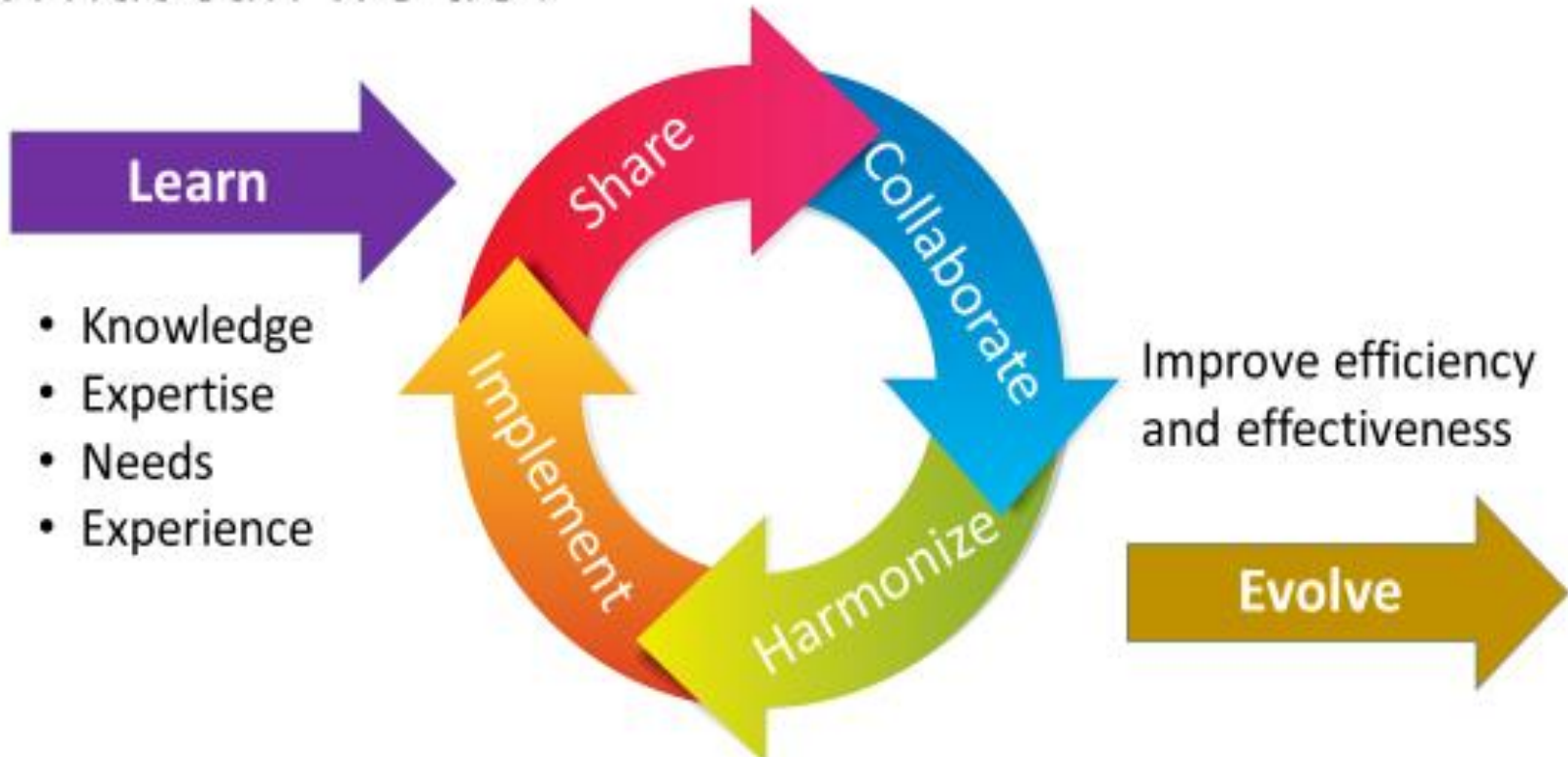


# Perspectives on inspection

- Inspector...
- Importer and exporter...
- National Plant Protection Organization...
- Customs...
- International Plant Protection Convention...
- World Trade Organization...
- Stakeholders, fee providers, and the general public



# What can we do?





# Symposium: 7 session themes

- The global and historical context
- NPPO and RPPO experiences
- Industry experiences and perspectives
- Other government agency experiences and perspectives
- Insights from research and academia
- Analytical tools and methods
- Outreach and In-reach strategies and experiences



# Perspectives from the Symposium

## LEADERS...

- **IPPC Secretary Xia** confirmed importance of topic suggesting that follow-up symposia were needed and supported by IPPC.
- **PPQ-DA El-Lissy** noted adamant support for RBS and PPQ was committed to systematic implementation
- **Director General de Sanidad Vegetal Trujillo** noted importance for countries to have a common understanding of concepts and ideas for implementation



# Perspectives from the Symposium

## NPPOs...

- Mark Powell (ORACBA) cautioned about careful designs based on clear objectives.
- EPPO and APPPC noted growing acceptance and implementation in other regions.
- Australia and New Zealand reflected positively on their extensive experience in implementation.
- Mexico noted their development of manuals
- US discussed experience with Plant Inspection Stations



# Risk-Based Sampling



- Directing inspections away from lower risk items toward higher risk items
  - Ratings-based
    - Rate country-commodity combinations by risk
    - Implement after rating phase, then monitor
    - PPQ experience (NARP, Cut flowers)
  - Continual sampling
    - Dynamic states based on ongoing inspections
    - Immediate implementation
    - Australian approach (e.g., apricots, coir, dates)



# Perspectives from the Symposium

## Government Organizations...

- The PREDICT system used by FDA was shared as a model for RBS collaboration with CBP.
- CBP has broadly implemented Compliance-based Sampling using the same concepts
- Pest risk should be seen as one aspect to be integrated into this design. CBP strongly encourages this development.
- Any future inspection designs must consider the WTO-Trade Facilitation Agreement and Single Window System



# Perspectives from the Symposium

## Industry...

- Industry was clearly aware and interested, some actively producing their own designs.
- The US experience with NARP provides a useful foundation for expansion.



# Perspectives from the Symposium

## Researchers...

- Research has provided useful guidance for optimal designs and methods.
- Research has demonstrated the effectiveness of
  - enforcement leverage from RBS
  - “carrots and sticks”.
- Data challenges are widespread and numerous.
- Many different designs can be legitimate and defensible.



# Perspectives from the Symposium

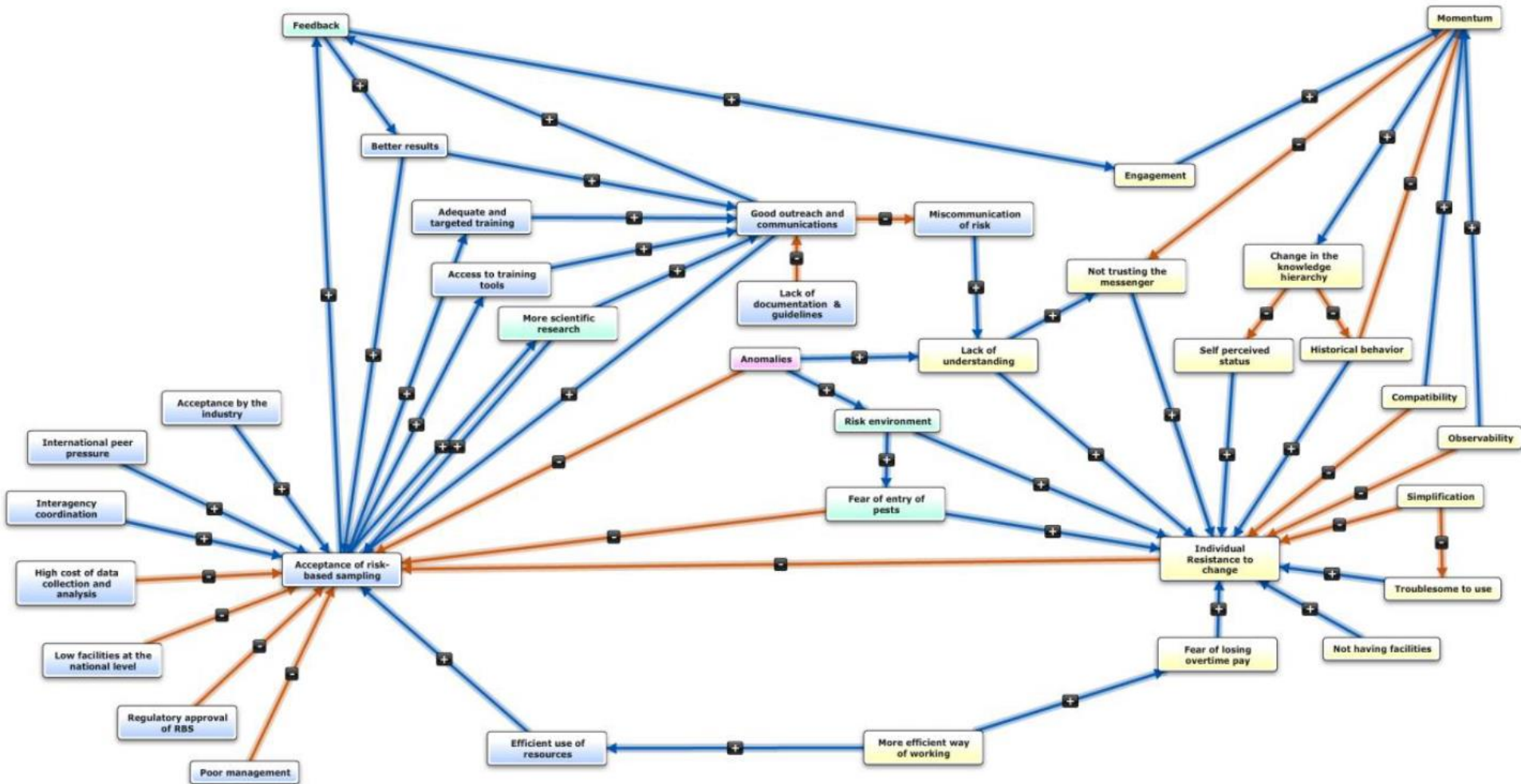
## On communication and outreach...

- Well-designed communication strategies are essential.
- Cognitive mapping may be a good tool for better understanding implementation challenges.
- Hands-on training is a helpful tool





# Real-time FCM model



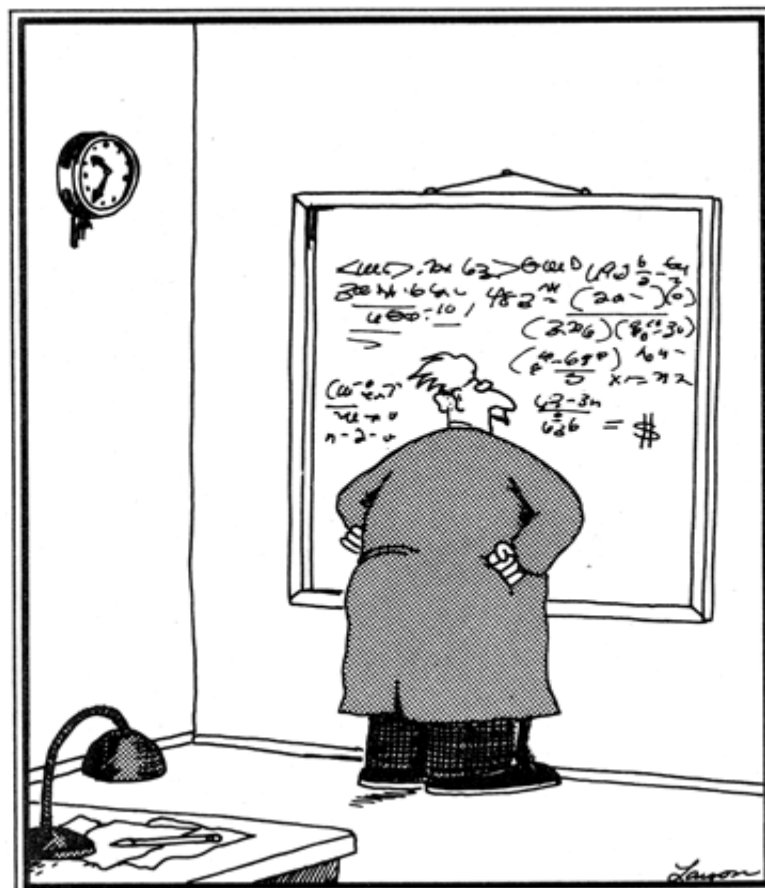
# Deliverables of Symposium

- NAPPO producing Proceedings as a record of the meeting. IICA will translate into Spanish.
- NAPPO is leading international collaboration on a manual for the IPPC.
- Check NAPPO website for updates



# RBS Advantages

- More efficient inspections program
  - Less resources on lower risk items
  - More resources on higher risk items
  - Savings could be directed into greater intensity
- Incentives for industry to be cleaner
- *Feedback between inspection and targeting*
  - Places inspection in a better context
  - Lets inspectors see impacts on programs
- Technically defensible



*Einstein discovers that time is actually money*

dank u  
 Tack ju faleminderit  
 Asante 谢谢 Tak mulțumesc  
 kiitos **Gracias**  
**Salamat!** Terima kasih Aliquam  
 Merci **Dankie** Obrigado  
 ありがとう köszönöm **grazie**  
 Aliquam Go raibh maith agat  
 děkuji **Thank you**