Seed Health Summit

Summary of Proceedings

DRAFT

July 15, 16 and 17, 2014
Riverdale MD

Introduction

Agricultural seed imported into the United States is subject to limited inspections. The Federal Seed Act is applied and there is some inspection for noxious weed seed and other visible pests. Some grains like corn and rice have long been regulated. However, there is no testing of seed imports at ports of entry by APHIS for plant pathogens such as fungi, bacteria, viruses or viroids, which can have a serious impact on seed production, fruit and vegetable production, and the grain industry.

The Animal and Plant Health Inspection Service, (APHIS), Plant Protection and Quarantine's (PPQ) limited work force and the sheer volume of seed imports from worldwide sources prevents adequate inspection. There are limited tools available to test for fungi, bacteria, viruses and viroids and currently we lack the capability to test at U.S. ports of entry due to the time, expertise, and infrastructure required for testing. In short, we lack the resources needed to test all seed coming into the country.

Due to the recent introduction of a virus, Cucumber green mottle mosaic virus, into California via imported seed, the need to take mitigating action and prevent a reoccurrence of the disease brought the seed industry and APHIS PPQ together to look for a solution. The issue of re-evaluating our agricultural seed policy was identified as a key component of addressing this problem. With this Seed Health Summit, held in Riverdale, MD in mid-July, 2014, APHIS PPQ, states, other federal agencies, universities and industry are initiating an ongoing dialogue to develop a joint/collaborative approach to deal with agricultural seed imports and trade issues.

We acknowledge that certain options may be appropriate for some seed-transmitted diseases but not for others. To that end, another goal of the summit is to create cross-organizational working groups of industry, Federal, and State experts and representatives to evaluate specific seed-transmitted diseases and recommend safeguarding options for those diseases. To the extent that the members of these working groups begin to work together to develop strategies for dealing with those diseases, the summit will be successful.

Our long-term goal for the summit is for it to lead to a system or format where industry and regulators (including APHIS) work together to assess options, that include both rulemaking and alternatives to rulemaking, to mitigate some of the risk posed by the importation of agricultural seed.

The rest of this document contains the proceedings of the Seed Health Summit. These are the topics covered:

- Framing the Problems with Seed Transmitted Diseases
- Developing Potential Solutions
- Addressing the Challenges for Specific Issues
    - Cucurbits
    - Wheat
    - Solanaceous crops
    - Corn
    - Rice
- Panel Discussion—Government Resources for Trade Issues
- Summit Agenda

Framing the Problems with Seed Transmitted Diseases (Issues Identification) Tuesday July 16 and 17:

Accreditation/Certification:

- Must be robust
- Uniformity of accreditation process; but what about using a buffet approach?
- Must be transparent and defensible to trading partners
- What does it take to lose accreditation/certification?
- Train farmers to recognize pest-free certified seed companies
- Support a process of accreditation/certification giving seed producers a 'stamp of approval'
- Scope creep --- how can we handle this? What should be the scope of regulatory agencies, industry, others? Doing pathogen 1 >>> can you also handle problem 2
- Needing a system for handling complaints. A formal way to address vs simply opting out!

Advanced Technologies: New tests for new pathogens / upgrading older tests --- what processes are available to deal w/new pests?

- International system not able to bring in new technologies; this is still largely a matter for developed nations
- Validation issues --- what's needed to have new tests validated >>> Is what's in place currently adequate?
- Testing what / testing how --- the issue is complex; we need to focus on the most critical of questions regarding testing policy and procedural improvements
- Testing destructive vs non-destructive --- this is still a matter of concern
- Proper detection mechanisms? This is part of a broader issue
- New cultivars come to US then might get domestic diseases ---- this is another issue outside of the norm we face
- Epidemiology --- what is needed? >>> the role of seed transmission is poorly understood; pathogen / species specificity, etc.
- Risk --- what is the real risk posed by importation >>> domestic, international, to customer?
- New technologies
    - next generation >>> what do we do w/unknowns?
    - Deep Sequencing >>> may lead to new pathogens / new diseases?
- How might inspections be done >>> visual methods? Reliability. Environmental conditions? Inspector dependent activities >>> constraints.
- Are there validated diagnostics available? Will it work? What about lab proficiencies?
- Post entry grow-out --- is this a viable option?
- Lab level of confidence? What assurances are there for quality and competence?
- Who should be charged with implementing said/same (quality assurances)?
- Diseases/pathogens in other countries still unknown - we're saying a lot, others say little!
- If all seed coming to US needs testing >>> who pays for it?
- Are we trying to ease back on regulations? Benefits vs risk

- How to detect when infections are very low?
- Some nations --- PCR is available and being used --- some nations moving rapidly in this direction
- Most of seeds are treated! Problem is diagnostics. Treated seed can't be well diagnosed!
- What does treatment do to extant pests? Note: In most cases it is process of industry to treat untreated seeds! Organic seeds pose unique phytosanitary challenges.
- Testing also needed for pathogen viability

Benefits vs Risks:

- What are the benefits of allowing material to come in vs the risk of allowing this to happen?
- Self-regulation vs no regulation vs heavy regulation? Where's the balance?
- How do we ease the restriction on imports?
- Right now there are no restrictions on imports! INCORRECT >>> prohibitions on some seed and some phyto restrictions! Most seed is allowed entry with a visual inspection at the POE plus proper phytosanitary certification.
- We need to update relevant PRA's
- NAPPRA comes up as an issue >>> but it does not apply to seed
    - Would we like it to cover seed?
    - Prohibited seeds reg put under NAPPRA – this might help – Q-37 restructure may help
- Many commodities have historic entry patterns >>> how does this play into the equation of benefits vs risks
- Regarding disposition of long-term prohibitions >>> can newer technologies help?
- Exporting country will not follow up on a market access request regarding US seed producer working in their country --- must be priority from exporting country. Currently might not be a priority for them
- Can risk realistically be analyzed regarding a particular country --- items moving throughout the world now; it's a global game
- US has ability to assess global risk issues using its vast store of information, technology, and talent
- Transparency in countries where seed is largely produced --- this is a need of US industry
- *Rosa spp.* has been looked at globally --- but it's hard for other countries to see their role in the matter >>> are some of our current int'l standards handling this matter
- Traceability from true country of origin is difficult – multiple countries of origin may be a reality

Budget:

- Capacity is a consideration
- Where is Agency headed?
- What's the impact of continued sequestration --- what's our plan to get thru this?

Communication – Clarity of Discussion:

- Lack of uniformity in the discussion
- What is seed-borne? Seed tramsmission?

- How to detect low level infections? Environment, skill of inspections, timing, validated methods

Contamination:

- Weeds cleaning facilities (seed conditioning facilities can clean/condition seed by removing contaminants including most weed seed, debris, soil, etc. Can sort/separate on the basis of size, color, shape, density)

Connectivity:

- Import issues / Export Issues

Economics:

- Economic assessment of seed-borne diseases >>> also important to prioritize work based on economics of crop
- Cost of containment or regulations
- Cost/benefit of phytosanitary measures
- Vulnerability of crops of regions of production --- meaning??? I assume to introductions/establishment of new diseases/pests via seed

Education/Outreach:

- Grower awareness is important
- Messaging to growers/industry regarding disease is critical
- Incentivize accreditation programs --- compliance w/o penalties
- Pest advisories and training --- grower awareness is important
- Industry demanding seeds of importance
- How can we reach seed companies that are already out of the loop and lacking internal controls and quality management systems?
- Communication and open dialogue are important
- Seed growers inadequately trained for seed health; what to ask for; where to test; what to do during production
- Take advantage of all resources; e.g. media outlets

Exports:

- Import regs often affect export regs in time
- Export of seeds equally important --- discussion needed

Harmonization: Harmonization is lacking

- Among national, local, public, private, industry stakeholders as well --- trade movement
- Harmonized seed testing methods lacking
- Harmonized accreditation processes lacking
- Lack of trust by stakeholders in the process of accreditation
- International harmonization lacking, regarding standards interpretation

- Lack of standardization of processes among state/local gov't >>> industry lacks info on processes especially as they vary among state/local gov't
- Lack of consistency and oversight in seed imports

Industry:

- How to compel companies to use measures to prevent infected seed from entering the US
- What incentives exist for offer to growers to choose certified seed? Caution re terminology 'certified seed' --- need to look at regional differences --- statement needs qualification
- Is industry open to keeping seeds untreated? Note >>> samples are pulled before treatment (retention sample)
- Looking for alternatives, but we need teeth --- checks and balances --- Federal Order is last thing to fall back on (Alamo)
- Accountability at all levels --- programs proposed and run well; make accountability when not abiding by rules

International / Off-Shore Initiatives:

- Processes might be considered to allow for testing in country of origin; but who pays?
- Lack of NPPO resources to address international movement of seed
- Interrelationship among the regional partners, NAPPO, EPPO, etc
- Current safeguarding facilitation not aligned with global trade
- Bring in propagative material for seed production
- Politics!
- What is the role of ISHI?
- Challenge – we can't control chemicals applied off-shore

Leveraging:

- How might we better tap into and use USDA/ARS resources? >>> ARS is only part of team. Let's include everybody else re the equation
- NPDN may be a resource --- focusing on seed issues, plus added methods development leveraging

Permitting:

- Imports by permits? More work for importer ;-(But raises the bar for importers lacking quality management systems ;-)
- Could a systems approach be applied?

Phytosanitary Issues:

- Current phyto system is insufficient to pick up infections

Port and Inspection Issues:

- Lack of appropriate resources at ports of entry to detect seed-borne pathogens

- CBP interpretation of USDA regulations
- Inspection processes are expressive of symptoms; how do we handle masked symptoms; are there confirmatory processes?
- Ebay! What about US mail?
- Important to provide inspectors w/guidance regarding risk

PRA's:

- Biologically based pest risk assessments are important
- Environmental and ecological assessment of diseases >>> predicting where will a disease occur
- ID pathways for seed-borne vs seed transmitted pathogens
- Published papers may not be applicable to current situations
- PRA's based on very old publications --- what can we do in these cases?
- Is the seed a pathway for a particular pathogen?

Processes and Procedures:

- Emergency procedures are crucial; transparency, consistency among the States and associated programs
- Fraud opportunity with current system
- Chain of custody is an issue

Re-Export Issues:

- It's a way of business
- Multiple requirements practiced
- Trade protection vs maintaining custody

Regulations / Non-Regulatory:

- Re-evaluation of 'hold-over' regulations per specific uses
- Keeping up w/o stopping
- Process timeliness is important
- How do we address material historically thought of as low risk
- Various requirements for same pest w/different results
- Different opinions on the ''science'
- How can we take a non-regulatory approach and get compliance?
- Current import standards are dated!
- How to utilize a state system (Market Order) to broker processes

Reporting:

- Failure of discomfort with reporting problems by growers

Resources and Resources Allocation:

- Resources allocation, APHIS / Industry / States, is crucial
- How best to tap into collective resources – not to recreate wheel

Responsibility: Unclear understanding of responsibilities; gov't roles vs industry (incl. growers)

- Leveling the playing field is important >>> players need opportunity to be raised up
- Can we do this w/o more regulation
- How can this be do w/o regs and yet assure accountability?
- Identity preservation and safeguarding (trust)
- Is the fox guarding the chicken coop. If company is testing own seed, can we trust the process??? Generally, yes --- remember that it's not in industries best interests to cheat

Science – Scientific Information:

- Complexity of scientific info – this affects Risk Assessments
- Conflicting info is problematic when doing RA's
- Experimental evidence only is sometimes all that's available; how should this be used?
- Scientific info unclear or nonexistent >>> do we communicate same w/trading partners? What's the impact?
- Pest lists extensive >>> processes for better communication to remove unwarranted organisms from lists is crucial >>> many are technically unjustified
- Does US have to accept all data provided to us from trading partners?
- Identification and prioritization of diseases of concern
- Credibility / validation of information of agencies outside of the US
- Seed transmitted diseases; what to do; testing is difficult and costly; no treatments; visual is not enough
- Seed testing needs better methods development; validation is slow and lacking
- How can we ensure that imported seed is free of seed-borne diseases?
- Seed transmission --- outside/inside seed --- needs added work; where pathogen is in seed; living pathogen?, etc. e.g. Stewart's wilt of corn (amount of infection before issue becomes relevant)

Small Producers:

- Many small producers are from high risk areas
- Small seed companies may be disadvantaged; esp in other countries

States:

- Limited flow of info to States >>> a 'black box'

Testing:

- Issues = timeliness, cost, availability, destructiveness of some tests
- NPDN may be a resource --- focusing on seed issues, plus added methods development leveraging

Timelines:

- Timeliness of testing is important

- Bigger issue >>> transparency, communication, capacity issues
- Need for ability to expand --- be creative re partnering >>> eg NPDN

Traceability:

- Traceability of seed lots and components is very important

Violations:

- How do we deal w//the one 'culprit', outlier, bad apple --- focus on them and keep the rest of system moving

Volume:

- Large volume of seed being imported with limited requirements

Maintaining Chain of Custody, Communications = linked!

Developing Potential Solutions
July 16, 2014

Conduct Fundamental Research needed

- Need fundamental scientific information and interpretation --- research, information

Identify all Potential Resources

- State regulators
- NPDN
- Establish common goals; pest lists; pests of concern;; ID the CCP's to manage risk; testing methods; Standards, voluntary vs regs; education outreach
- ISF lists --- impressive --- can we work w/this list
- Funding/Resources
- Concern about Plant Pathology resources coming up:
    - Plant Pathology not well provided for at universities
    - Well rounded education ---- Applied Plant Pathology lacking at colleges --- disturbing trend --- can we influence?
- Need to increase the number of experts involved

Identify, Prioritize and Communicate Needs

Pest Risk Assessment is Needed for any Solution

- Another way to access PRA process?
- Develop PRA transparency for ease in public review

Develop a Voluntary Program

- Industry driven but w/checks & balances
- HACCP process --- no regulations but checks/balances (Regulators role would be in the areas of checks/balances)

Develop Industry Programs with Government Support

- Ways to mitigate/prevent reoccurrence of incidents
- Industry driven
- Cert program – HACCP
- Modify what we currently have
- USDA recognize program
- USDA provide system of checks/balances – risk based
- Standardized testing protocols. BMP's
- Work Group to develop this >>> IMPORTANT
- System to screen material
- Establish Pilot program --- morph into regional standard; industry driven; not heavy regulatory
- More APHIS involvement in ongoing seeds activities
- Regulators need backing for decisions – mechanisms exist now how can they be used in an industry focused approach?
- Recognize current industry practices
    - Customized accreditation to the situation

- Look at whole system, but also recognize extant processes from specific company
- Imports/Exports? What needs to be done – customized
- Encourages accreditation
- Build on NSHS --- phytosanitary certification

Develop Accreditation/Certification Instruments

- Applied correctly = Good compliance tools
- Great industry opportunities
- Business plan incorporation
- Benefits/Cost analyses
- Partnerships
- Improved application in current regulations
- Trade facilitation
- Increased accountability re industry
- Peer reviews w/I industry --- not feds but industry peers >>> measure achievements re goals
- Shifts role of regulators from regulation to more so an auditing role

Build Accountability into any System Developed

Develop Solutions that are Alternatives to Rulemaking

- Prove rulemaking is least restrictive
- Community education w/chance to solve issue in non-reg way
- Market forces/ Market driven
- Education campaign on continuum re benefits of using disease tested seed or knowing season inspection status
- Ties into existing accreditation program --- more entities needed --- demand created at ground level
- Increase in accredited entities is metric to see if education campaign works
- If reg ultimately required >>> metrics re reason exists!
- Educate end user re what diseases to be concerned about; re transmission; re pathways >>> also reducing seed/pathogens of concern >>> what should stakeholders be concerned about

Conduct Education and Outreach (Important to Voluntary and Non-Regulatory Approaches)

- Community education w/chance to solve issue in non-reg way
- Education campaign on continuum re benefits of using disease tested seed or knowing season inspection status
- Educate end user re what diseases to be concerned about; re transmission; re pathways >>> also reducing seed/pathogens of concern >>> what should stakeholders be concerned about
- Education outward and education inward
- Do regulators have clear picture of what's already in place
- Do regulators understand industry
- WG – to understand situation >>> ASTA website
- Show end user the benefits >>> guarantees are not feasible; but a grower would potentially buy certified vs non-certified
- What's already out there re baseline for further action

- Outreach/Education about permit requirements --- at application >>> information also provided >>> outreach >>> joint collaborative effort of outreach among stakeholders

Use the Existing National Seed Health System

- Make it stronger --- enhance it
- Prior report already in place that can be helpful

Develop Testing Strategies

- MOU's w/State Seed labs
- Connectivity exists >>> USDA/AMS >>> reach-out possible

Develop Standard Processes

- Could this be established?
- ID resources that could help with
    - Process
    - Methods
    - Who are the experts?
    - List of contacts

Consider What Changes are Needed to the Regulations

- Are foundational rules needed for these approaches?
- Bring stakeholders into discussion re next changes
- In vs Out changes
- Focus commodities w/more intensive sessions --- focused down to the next level
- International standards into the equation

Consider a NARP-like program for seeds

- Reduces OT, rewards industry What's "OT"?
- Recognize the work already done >>> ISO, AMS, etc. can we just recognize that?

Use a Crosswalk Diagram to Understand Issues Common to Different Commodities

Develop a Systems Approach to Deal with Future Issues Rapidly

- Robust reg program >>> communicated. Systems approach, accredited; sound science
- Generalized rapid response plan is desired
- Roles of stakeholders and affected parties
- Communication tree
- Decision tree – re response and processes/procedures
- Transparency – task oriented
- In addition --- use a graduated entry system >>> Tiered approach >>> new/emerging vs already known
- New Emerging pests
    - Build greater collaboration w/Industry
    - ID pathogens on industry radar
    - Build an emerging pathogens system
    - Utilize what we have (e.g. ASTA llist, ISF list, PestID, Offshore Pest Info Program, etc.) >>> to ID new emerging pathogens such as CGMMV

    - New to regulators but maybe not so new to industry
- Policy --- Roadmap/Flowchart --- Determining if seed is pathway
    - Reliable tests?
    - Pathogenicity?
    - Low risk issues
    - What's the impact --- how do we handle issues >>> appropriate response
    - HACCP, CCP's
    - How do we apply extant resources
    - What are the real risks?

Leverage lessons from other industries

- For example: the automotive industry
- How did this come to be >>> e.g. quality improvement
- Has somebody else (even in another industry) already dealt with the issues we are dealing with? How?

Addressing the Challenges for Specific Issues
July 16, 2014

Cucurbits/Cucumber Green Mottled Mosaic Virus (CGMMV)

Next Steps/Future Actions:

1. Working Group: include growers, seed producers, Academia, APHIS, PPQ (policy, field operations and science & technology)
    a. Proposed Face to face meeting in October
    b. Draft? What would a certification plan look like?
2. Outreach continue by industry
3. Start conference calls in 2 weeks after the summit
4. Industry begin to investigate best management practices
5. Craft quality assurance outline (B)
6. Confirm regulatory authority to take action @ Ports of Entry

Issues and challenges:

- How do we prevent the re-introduction of CGMMV without additional regulation?
- Inspection at the ports of entry does not ID the pathogen (visual inspections)
- Biosecurity without additional regulation
- Industry driven with "teeth"
- How do you entice companies to participate in voluntary programs?
- Resources are limited to implement screening and testing at ports of entry
- Need standardized sampling and testing
- Need certified labs (through the National Seed Health System?) and facilities
- Research needed to frame issue
- Outreach and education growers to source from certified source of disease-tested seed
    - Educational pull-through
- Possibility for NAPPO certification and collaboration if basic standard/certification program can be developed
- How can we recognize existing Quality Management Systems
- Standardized Best Practices- Industry driven:
    - Production practice
    - Seed production location
    - Seed testing –ISHI/ISTA/NSHS method published
    - Industry demonstrates how requirement is met
- National Agricultural Release Program drive sampling strategy
    - Incentive for "clean" companies
- Include internal audits and reward success
- Keep in mind companies of all sizes as process is drafted

- Minimize role of regulators and empower industry to drive program
- Understand biological significance/risk of pathogen in different markets, seed production vs open field vs greenhouse
    - Scientific basis for risk assessment
- Tiered program—start with minimal standard such as testing and incorporated certification over time
    - Voluntary – test seed→ HACCP-type program
- HACCP: adds cost and difficulty to production
- Dealers/Brokers
    - Challenge to have them source seed from reliable sources
    - Require test history/production records
- Industry designed Biosecurity Program
- Export restrictions will they be applied if CGMMV establishes
- How do we engage small companies and dealers
- Educate growers with correct questions-market demand
    - Sample method
    - Test method
    - Use of HACCP or QM programs in place?
- Industry "sell" the program, generate confidence demonstrate value
- LMV model?
    - Fractured approach
    - Country involved
- Educate producers
    - Consequences of CGMMV on farm
    - Loss of land use for susceptible crops
    - Show $ value of impact
    - Trade impact – loss of market options

Solutions

1. Industry driven Biosecurity Program
    a. HACCP program principles
    b. Tiered program / level of implementation
    c. Standardized Best Practices
    d. Establish minimum standards
        i. Testing
        ii. Field practice
    e. Regulatory role or market-driven?
        i. Risk based program to drive sampling @import – country of origin, risk of company practices - NARP
        ii. Include random samples of all producers—statistically modeled

f. Research needed to ID and validate sampling method – confirm significance of the test results
g. Standardized sampling and testing
h. Random sampling of imported seeds for testing
    i. Hold at port of entry
    ii. Release to seed company
i. Wait for test completion before pellet or other treatment
j. Bring in shipment under bond—storage in bonded warehouse
k. Red/white permit system (PPQ 526) to pre-ship samples
l. Check/Balance sampling/testing. If test is positive:
    i. Re-export This is not a preferred industry option.
    ii. Surrender for destruction
    iii. Treat when and if available
m. Alert program for positive (CGMMV) seed after official test
n. What would trigger loss of Accreditation
    i. "critical" non-conformance
    ii. Defined as part of the program
o. Audits
p. Defined Best Management Practices
q. Outreach and education to growers and brokers

Questions and concerns from the rice group (group answers in red):

1. Will industry pay for the testing?
    a. Yes
2. Logistics at the port of entry: how will PPQ and CBP interface?
    a. CBP will pull samples State officials could pull samples post entry (AASCO).
3. Takes advantage of systems already in place: NSHS HACCP, State Laboratories etc
4. Big improvement over the current situation
5. Subject to approval by APHIS? Is it acceptable from a regulatory perspective
6. HACCP – needs to be an auditable program Accredited companies may not have to have all consignments tested; just sample for verification of efficacy of company QM programs under their accreditations
7. Audits to cover positive results by producer location – improve definition of risk
8. Would we be comfortable if other countries imposed program on us? N/A
    a. Retaliatory impact? Industry driven
9. Can APHIS request pest-free production areas?
10. Expect NPPOs would meet requirements for pest-free area
11. Accountability for loss of crop? Between buyer and seller
12. Oversight state/federal
    a. Industry program with APHIS oversight?
    b. Hope for market driven approach?
13. Good that "repeat offenders" would be subject to more stringent measures/testing

14. HACCP very successful in poultry industry in Arkansas
15. What happens if this (CGMMV) is found again?
16. What are consequences for importer if CGMMV is found
17. Good Approach
18. Regulatory change needed to catch 57% (of what?)
    a. Can we get market demand to drive culture change
    b. Market demand/education is first step (stop gap)
    c. Rule change may be required
    d. Send commodity under quarantine to destination for county ag commissioner to inspect / sample
19. Seed Advisory Board drive test requirements?

Wheat/Wheat Blast

Next Steps and Action Plan

1. Seed allowed to enter the U.S. under current PS guidelines. These guidelines are being updated in a new International Standard and Phytosanitary Measure being considered through the IPPC. Stakeholders can comment on the draft now (comment period closes mid November)
2. These will happen concurrently:
    a. Technical Working Group (TWG) to address research gaps; include rice blast experts also barley and triticale to ensure we have the best available science (CPHST, Charla Hollingsworth)
    b. Survey current industry protocols and practices
    c. Establish a wheat blast task force to include PPQ and ASTA and others as appropriate (Ric volunteers to take the lead (see #4))
        i. ID areas of low risk in South America
        ii. ID areas of low risk in the US
        iii. Need models on seed risk from and environmental impact on environmental spread
        iv. Seed testing protocols
        v. Seed Treatment
        vi. Field inspection
        vii. CAPS survey (US monitoring) –industry plots/fields
        viii. Build action framework (e.g. soybean rust) and hold exercise
3. APHIS to work with industry, state government and other appropriate groups to determine best practice and regulatory method (Permits, WTO notice etc)
4. Remain in constant communication to maintain forward motion
    a. December meeting—US wheat and barley – St Louis
        i. Fusarium Head Blight and Wheat Blast: December 7-9
        ii. Maintain resistance to other wheat diseases as we work on resistance to head blight etc

iii. Some of group will meet with this group

b. ASTA convention—December in Chicago December 8-12 (discussion on wheat blast is on the agenda)

c. APS—August 9th wheat blast grant group – internal 2 pm

Issues and challenges

- Questions regarding epidemiology in US: is it a threat to US wheat
- Information on distribution—especially Argentina
  - Validation and reliability of report
- Host range still unknown
- Variation of virulence in strains
- Disease cycle unknown
- Brazil provides seed to Argentina
- Level of acceptable risk
- Efficacious treatments?
  - Treatments labeled for wheat blast by EPA
- Information needed to mitigate risks
- Validated molecular test for PoTp
- Percent infected seed as detected by ISTA method min. # of seed to test

Solutions

- Avoid over regulation to encourage open reports on distribution
- US monitored (seed industry?) plots in low risk areas
- Accreditation/certification-BMP/NPPO relationship—safeguarding provisions
- Move seed under permit
- Scientific information gap—does industry have additional information
- Technical Working Group to capture and share on the ground published expert information
  - Targeted list of questions (5-10)
  - List of technical experts; responses from them
  - Conference call
  - Revised responses/review
  - TWG via CPHST – only scientific information provided to Plant Health Programs for their consideration
  - Consider finding lower/lowest/nil risk
    - Areas in Argentina for import to lower the risk regions in US with appropriate safeguarding measures
  - Process: formal written request for the TWG—possibly with KSU review

    - Convene TWG
    - Seed testing (ISTA) as a screening tool—NPPO and US capacity
    - Identify low/no risk production areas
    - Seed treatment recommendations
    - NSHS accredited labs?
    - +/- results
- Harvest in Argentina /SA – Spring wheat late December to early February
- Seed preparation—planting in US April to May

General SB/ST discussions (Wheat Blast)

- Research needs:
    - Epidemiology
    - Detection technologies
    - Biological basis for recommendations and regulations
- Generate publications for international communication and review
- Funding and resources
    - ARS-NIFA
    - Commodity grants
    - NSF
    - State agencies
- Communication
    - USDA-ARS, PPQ ←broadly with subprograms, AMS
    - Industry
    - APS
    - States—governments and universities
- Expanding collaboration and partnerships
- Open avenues to request PRA's –ad hoc requests
- Issue with NPPO generated commodity PRAs → US industry needs
    - May not be parallel with those of NPPO
    - Process for industry/states to request
- Develop transparency PRA development and review (timelines) for industry and other stakeholders
- 1 degree PRAs input from stakeholders ? What does this mean?

Other Notes

- Do nothing – current PS
- ID areas of low risk
- Field inspection? → protocols etc.

- Seed testing – available methods
- Seed treatment
- Low risk areas in the U.S.
- Technical Working Group to inform final process selected
- APHIS to work with states and industry on appropriate vehicle (Permit, PS etc) validation process
    - Annual permit to company for a given country/region
    - Notice in federal register to announce changes to permit
    - Proposed rule—federal order –restricting pest/country combinations
    - WTO notice
    - Controlled import permit

Ritual dissent comments (These were incorporated above)

- Work in low risk area to get empirical data – sentinel plants already in nurseries—uniform system
- Build an action framework like soybean rust need to be ready for wheat blast
    - Do emergency response
    - Hold training sessions
    - UG99 plan/one meeting with action plan
- What are environmental factors conducive to disease development?
- Model is very important
- Seed testing is critical—industry ARS etc. at the table
- Costs to develop framework
- Avenues available to secure funding for research, research gaps etc.
- Companies – what information is new (valuable R&D)
- Is wheat blast important? What is the rate of seed transmission
- Wheat Blast risk is moderate at best to wheat production in US
- Do we need a regulatory response? Would it be effective?
- Is seed the only pathway for introduction to US not like Puccinia
- Gray ??? spot on ryegrass/ blast on Barley is universal susceptible—need to consider process
- Host resistance (ARS in Minnesota) Note—screening in place now at KSU, FT Detrick and heard there is some at MN now
- Testing methods—seed for ISTA for rice as a screening method (note: wheat could be tested)
- Add to the CAPS survey
- TWG:
    - Ginny ??? and IRRI (Note: Ginny is testing seeds)
    - Gary Peterson
    - Paul Ceresiano (spelling?)
- Need PoTp specific test

- Decent plan except:
    - Funding for industry???
    - Push for seed treatment—try rice treatments
    - Validated seed health test
- Fundamental research areas:
    - Risk model
    - Seed assay test by pathotype
    - Efficacious seed test
    - Source of inoculum
- Do we know if infected seeds germinate?
- Competition from saprophytes on blotter test
- Production practices to impact –what is impact on unique such as organic producers

Pospiviroids in tomato seeds

Next Steps and future actions

- Establish a working group (1-3 months)
    - Industry, NPB, Academics, USDA, Int'l cooperator
    - Define scope of the working group
- Compile existing data and analyze→ Gaps (6-9 months)
    - Compare existing protocols, industry practices
- Prioritize gaps and timeline to address (1-3 years)
    - Potential :
        - Surveys (e.g. Greenhouse tomatoes)
        - Basic research (epidemiology/biology)
        - Management tools
        - Validate method(s)
- As needed, work with other industries (TBD)
- Reconvene Working Group and identify next steps (TBD)
- Also need to know more:
    - What is the global distribution and incidence?
    - Need seed treatment options
    - Need to know about how these pathogens interact with other pathogens (synergistic effects)
    - What are the rates of seed transmission
    - What is the location of the pathway in seeds?
    - Are there opportunities for production lane crossings?

Issues and Challenges

- Do we know enough about the disease? What don't we know:

    - What is the potential for pospiviroid movement between the potato, tomato and ornamental pathways?
    - Is there potential for any seed treatments? None are currently available.
    - What is the incidence of these viroids worldwide?
    - What is the seed transmission rate?
    - What is the volume of seed traded?
- Detection with visual inspection is not reliable
- Pathways include ornamentals, potatoes, tomatoes.
- Pospiviroids can be transmitted mechanically, by grafting, by seed and in some cases by insects.
- Ability to identify the pathogen visually is variable and depends on symptom manifestation in growing plants (not seeds)
- The U.S. is sourcing from countries with the disease; essentially 100 percent of the tomato seed planted in the United States at least passes through another country.
- The capabilities and resources of the NPPO in source countries are all over the board
- The key challenges overseas are developing and applying protocols
- Good assays exist (e.g., recently developed Naktuinbouw pospiviroid PCR assay), but the specificity and sensitivity of different protocols need to be compared; a performance standard for these assays needs to be established; do we focus on genus level assays, species level, both?
- In conjunction with the preceding bullet, there is a need to establish the proficiency of labs using these methods.

Solutions

- Limited active testing is being done already by industry; we can leverage that industry knowledge.
- Industry can provide data, protocols and markets
- To get more industry buy-in, need to address the risk. What does industry gain? Regulations need to be addressed; perhaps integrated measures approaches based on industry practices (a la Ralstonia) can be designed and adopted.
- There could be more education and communication about these diseases
- The top potential solutions would be outreach and domestic surveys

Other notes

- CSPL and Naktuinbouw should compare methods and possibly include Australia
- CAPS: is this a priority? Feasibility of multi-state analysis
- Biology and incidence research needed
    - Correlate to molecular assay results
- Engage potato and ornamental (solanaceous) communities to understand their concerns
- Q37 impact and feasibility for all users
- We identified data gaps needed to assess risk—timeline for filling (see timeline above)?

- Can we regulate according to intended use? There was much reference to basic differences between field-grown tomatoes for processing vs, tomatoes grown in protected (e.g., greenhouses) environments vs. ornamental hosts.

Corn

The Issues:

- Suspect, quarantine, etc. plant lists not available to industry.
- What plants/seed disease is not known to occur in the U.S.
    - FPC information.
    - Official, transparent, consistent.
    - Information delivery system??
- Outreach and education
    - Need to compile and develop images of disease symptoms, pathogen morphology on relevant hosts, field guides and educational materials for extension, crop advisor community and industry and distribute
    - Also education on what diseases are seed transmitted and the benefits of using disease-tested seed (some industry participants mentioned they needed a list of quarantine pests/diseases.
    - If someone detects a pest or disease, they need to know who to contact in USDA
- Status of treatment options?
    - Chemical control: need to gather current information on industry activities related to the testing of more recently developed fungicides (e.g. strobilurins, azoles, etc.) for maize downy mildew control in Asia.
    - Determine fungicide product label registration status for maize, sorghum, and sugarcane based on chemicals in use in Asia
    - Investigate recent reports of P. phillippinensis metalaxyl resistance in the Philippines and implications for US maize production
- Detection and Identification
    - Need for rapid, validated diagnostic technology.
    - Difficult to identify in field or commodity
    - Early field symptoms of downy mildews are not reliable
    - Other pathogens or physiological conditions can cause similar symptoms.
    - NPDN has SOPs for diagnosing BSDM.
    - Morphological methods available
    - Molecular diagnostics: Need to improve diagnostic techniques for Late Wilt to facilitate isolation and diagnosis while distinguishing *H. maydis* from closely related *Gaeumannomyces-Harpophora* species.
    - Validate diagnostic techniques to insure proper regulatory applicability.

    - Standardize testing protocols
- Containment, recovery, mitigation options.
    - Update the APHIS '*New Pest Response Guidelines' Manual* for corn Late Wilt prepared in 2011
    - Update the Recovery Plans (developed by the National Plant Disease Recovery System (NPDRS), ARS/USDA) for the following maize diseases:
        - Late wilt of corn
        - Philippine Downy Mildew
        - Brown Stripe Downy Mildew.
    - Predictive modelling: Need pest assessment and prediction model for Corn Downy Mildew (P. maydis) by CPHST/PERAL. Create similar risk maps for other seed-transmitted diseases based on climate and crop data.

Quarantine Pest Lists:

- Pros (happening):
    - Q-56 process as model
        - Long term objective
    - Expertise re plant production
- Cons (not happening):
    - No list available
        - Country status
        - Pest prevalence (much of this information is available)
        - Crop production
    - Information exchange – weak
    - Weeds of POC relative to specific issue
        - State, Federal. industry
    - No contact (APHIS) with scientific community
        - Use of extension, crop consultants
    - Enhance info/expertise sharing

Treatment Options – Status:

- Pros (happening)
    - Industry with effective treatment/sanitation options
    - Existing knowledge (industry) of cultural practices
        - Need to evaluate effective cultural modifications to minimize disease severity.
        - Identify potential alternative crop and weed hosts of Late Wilt and Downy Mildews present in U.S. corn producing areas that could serve as a reservoir for these seed, plant residue, and soil-borne pathogens.
        - Downy Mildews also infect sorghum, sugarcane, crabgrass and perennial grasses of the US (may be able check on cultural practices that could transfer to corn)

        - Drying of seed below 14% moisture level will prevent transmission of the disease
    - State has emergency/treatment response plan template
        - Need to act! Need to update the plans
    - Industry introduction to 'off-shelf' treatment options

- Cons (not happening)
    - Need to incorporate crop/chemical compendium into PRA
    - Develop pest resistant varieties: This is the best method for handling the disease. However, US varieties of corn have little resistance to downy mildew. Identify sources of genetic resistance to late wilt and DM from foreign sources in Egypt, India, tropical Asia where these diseases are prevalent. Characterize resistance that is present in commercial corn cultivars grown in the U.S.

Containment/Recovery:

- Pros (happening):
    - Seed industry w/trace capability
    - Some APHIS, ARS, academic recovery plans available
    - Industry genetics work
- Cons (not happening):
    - No mechanism to align <u>all</u> accountable parties?
        - State, local, country, Federal, industry--Possibly develop a web-site to exchange information

Next Steps:

<u>Plan Outcome</u>

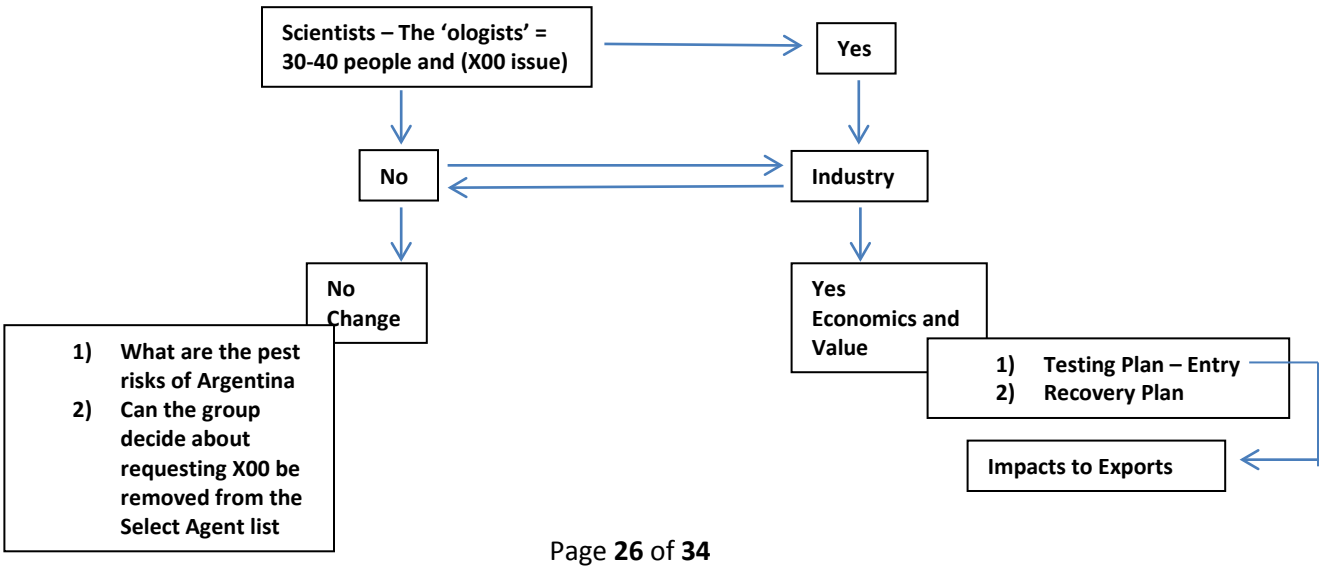
- Revisit current regulatory programs/plans (seed corn for planting)
    - Update old plans
    - Review restrictions (e.g. S. Africa) for enhanced trade options
- Corn included in Seed Summit because of market access request from South Africa.
    - Current APHIS/PPQ regulation: Seeds for planting prohibited from SA (7CFR 319.24, 7CFR 319.41); Others: Permit required.
    - Peronosclerospora philippinensis (Philippine Downy Mildew) present in SA.
    - It is a Select Agent – Consider Delisting as Select Agent? (Brown Stripe DM also Select Agent-not present in SA)
        - PRA in progress by CPHST
        - Use systems approach, develop protocol;
        - Ask SA for disease-free growing and production areas?
        - Resources and capabilities of S. Africa?
        - Seed testing and Certification: At port of entry?
        - Certified labs (NSHS?)

- Q-37 restructure: New Proposed Rule requiring Phytosanitary Certificates for seeds for planting would allow more regulatory options, including ADs (Additional Declarations) attesting to a country's freedom from pest or certification from accredited facilities.
- What level of risk are we willing to tolerate?
- Outreach Plan
    - Inform key stakeholders on report options
- Emergency Response Plan
    - Recovery if detected
    - Identify appropriate response (e.g. evacuation, mitigation, etc.)
- Convene task group to address items above plus align with issues and conditions
    - Need guidance in setting up Task Force comprising USDA, agricultural industry (what about small seed companies?), state governments, academia, etc. to move forward with diagnosis, domestic surveys and timely response.
    - How do we select TF members, bring people together with expertise in corn diseases. NPDN, NSHS?
    - Any corn meetings in the future where these issues can be brought up?

Rice

Importations of Rice --- the X00 Issue:

- This is an issue. Rice into the US is prohibited/restricted entry as per 7CFR319.55.
- X00 (pathogen) is listed as a 'Select Agent' to the XO level.
- Market access has been requested for entry from Mexico and Argentina.
    - Status >>> Rice industry and scientists are not in agreement as to the pest status/risk.
    - Solution >>> Bring scientists together to build consensus for the science to help formulate a unified decision about pests specifically in Argentina.
- Discussions can be Industry Driven or Regulatory Driven. Following is a decision-making tree that might follow:



- Things to think about changing:
    - Past info – usage today
    - Cultural practices

Regulatory Meeting:

- Can we host a 'system' or meeting to bring people together, people who have a stake in a particular commodity, to find agreement and compromise.
- Do this before making unilateral changes to regulations.
- 2014 – Rice meeting in December – bring these issues to the discussion.
- 2015 – Announce the meeting for 2016 --- submission of workshops; discussions.
- 2016 – Hold meeting >>> proposals for action supported by rice community

Scientific Task Force:

- A useful body that can help align international standards with other NPPO interests.

Panel Discussion—Government Resources for Trade Issues
Thursday, July 17, 2014

Panelists:
Julie Aliaga, APHIS PPQ
Christian Dellis, APHIS PPQ
Christina Devorshak, APHIS PPQ
Wayne Dixon, NPB
Lottie Erikson, APHIS PPQ
George Galasso, Trade Director, APHIS PPQ
Walter Gutierrez, APHIS PPQ
Eric Nichols, APHIS IS

Pest risk assessments (PRA's)

Market Access Process for U.S. Exports:

a) Determine if there are existing import requirements.
b) Ask that the requesting exporter apply for import permit.
c) Consult with International Services in that country to determine the phytosanitary requirements for related products.
d) By working with the industry or trade association, determine whether the request would be best served by a letter to the foreign NPPO or an augmentation of a pest list with CPHST.
e) PPQ will provide pertinent information for a preliminary PRA to the country and wait for a reply. Often this request will initiate the PRA process in this country. This preliminary PRA will be sent back for comment by industry and PPQ.
f) The foreign country and PPQ will agree on a pest list. Through a negotiated process, both parties will also agree on PRA with foreign NPPO. Through a consultative process, a pest mitigation plan will be developed. At every step, PPQ ensures that there is industry buy-in.

What's the difference between import and export pest risk assessments?
Import PRA (formal): Phytosanitary measures must be justified by an import pest risk assessment. It is the right and responsibility of the importing country to determine the acceptable level of risk and appropriate level of protection.

Export PRA (more informal): More of an elaborate pest list, with additional analysis, to jump start an iterative process. These PRA's do not draw conclusions as to the risk level of the pest. When an importing country does a PRA or a pest list, CPHST reviews it by going through every listed pest to ensure it's appropriate and meets the IPPC definition of a quarantine pest.

When developing the export PRA, CPHST considers the likelihood that a pest follow the pathway and if any treatments are available for that pest. Industry provides information on agricultural practices that can eliminate, control, or somehow manage those pests.

By what criteria does PPQ prioritize the PRA work and is there a way for industry to get status updates on PRA's in progress?
The trade directors in PPQ-Phytosanitary Issues Management consider the relative importance of the commodity, the potential volume and value of trade, implications for similar products, and the likelihood of success when prioritizing PRA's. PIM wants to know industry's opinions about which PRA's should be expedited though the process. PIM then sends the prioritized requests (with time limits) to CPHST. The goal to complete is approximately one month, but this is very dependent on scope. The PIM trade director can provide status updates for the PRA.

Import permits and requirements

Why do some import permits list three different names for the same pathogen?
Diseases are listed with multiple names in PCIT because countries still list the outdated name in their regulations. So, if it's still listed as one thing in the regulations, it must still be listed as such in PCIT. The IPPC is looking for a common standard for pest nomenclature.

Some countries have very long pest lists. A lab that is testing for seeds going to a country with a long list must test for all listed diseases, even if the disease is not present in that state.
In risk analyses, the occurrence of a pest in a particular area and its occurrence on a commodity or commodity part are determined. While there is an international standard that deals with how you would determine the pest status and how you would describe that to a trading partner, there are no criteria for how to determine the status of a host.

It's common for an importing country to go into CABI and pull up a list of every pest that feeds off all parts of a commodity. We are trying to develop agreed-upon criteria determining pest-host relationships using scientific literature and communicating that information with trading partners. Sometimes lists can be pared down if you can look at scientific data and see exactly what its saying.

Recommendation: Evaluate whether selected pests for seed import permits are technically justified by working with APHIS and the NPB using last six months-one year of import data.
It is useful to go back and look at a country's consistency regarding import requirements. If there is an inconsistency, PIM will send a letter requesting that the import permit be brought under requirements. There is a process between Export Services and PIM to keep abreast of those discrepancies.

We need a standard or revision of the standard for guidelines for including phytosanitary information on an import permit.

Is there an online list of are our import requirements to the United States?
FAVIR for Fruits and Vegetables (www.favir.org) lists import requirements for commodities imported into the United States.
The Plants for Planting (Nursery Stock) online manual currently being revised for easier use.

What proactive approach can we take to stay on top of constantly changing import requirements?
PIM expresses concern over requirements in constant flux, but no real hammer to force countries to be more consistent.

Often see additional declaration requirements that are not scientifically justified, can go back to those countries to remind them that their requirements are not sound. NPPO will not accept industry comments, only comments from APHIS.
PIM will consider messages from industry if a pest on their import permit does not qualify as a quarantine pest and can work with NPPO to reconcile that.

Every country under the SPS system must technically justify their measures (PRA). Countries do have right to shut down trade, such as detection of a new pest. But, they do have obligation to provide risk assessment in the future or remove that measure.

What if we have an emergency or a very time-sensitive situation? What can we do to trim off time to meet the growing season?
Directly contact the regional trade director for the importing country. It's his/her responsibility to negotiate with the country on that issue. He/she will get information from CPHST, risk managers, and Policy Management to formulate the best response and effectively get the desired outcome from that country. More often than not, this occurs in the form of a technical letter to the foreign NPPO.

Pests

Industry challenge: convincing a country a pest exists there when they say otherwise.

What happens if a pest is present in a country but the foreign NPPO maintains exclusion? In the United States, if a pest is under official control (efforts underway to limit or eradicate), we can take action to prevent further dissemination. From phytosanitary side, we don't normally get into tolerances of pests. Under IPPC criteria, if a pest is present in a country, that country is not able to impose import restrictions on it.

APHIS does not recommend 'freelance surveying'—as it's very difficult for APHIS to use that unofficial information in negotiations with foreign NPPO. It's very important to PPQ to maintain good relationships and credibility with foreign NPPO's.

ISPM 8: Pest status list kind of evidence that can be used to determine pest status from high reliability to low reliability.

How often do you encounter and how do you deal with subspecies-level restrictions, like different strains of the same virus?
Some countries restrict an entire genus, when only a few species in that genus are actually of concern. Our position is that you need clarify among species within a genus. Through negotiation, PPQ can usually whittle down or eliminate a number of species from the genus group. However, it is up to the importing country to determine the level of protection.

IPPC definition for species, strain, or biotype: When there is legitimate evidence that a different strain or biotype exists, it is able to be regulated as such.

Comment: Generally exporters do whatever they can to meet requirements, they do not want to fight or not ship because there are a few pests that don't make sense.

Can we get a list of the pests of most concern that will be taken action on upon arrival?
Trade happens on a country-to-country basis, quarantine pests are different with each trading partner because different countries have different pest statuses. Pest list for bilateral trade are made on a case-by-case basis and and quarantine decisions are based on this pest status.

There is a regulated pest list on the APHIS website; however, it is not entirely comprehensive, updated, or organized by commodity.

What if a country picks up anecdotal information about the presence of a disease online and says that markets will be shut down unless APHIS provides solid verification that the pest is not present?
For example, there is a regional trade director devoted exclusively to New Zealand and Australia, his/her responsibility is to respond to the NPPO's concern using the least amount of federal and state resources. Again, with a new pest or disease, the country is within their rights to request additional info.

Canada, Mexico, and U.S. all issue official reports when a new pest is found.

IPPC: There is guidance on how information may be regarded in terms of reliability, depending on source.

NPAG: Rapid evaluation of new pests with recommendations to PPQ leadership.

ISF is currently generating peer-reviewed pest lists based on phytosanitary requests around the world from various vegetable seeds companies. They have completed 4 pest lists (melons, onions, peppers, and spinach), have 8 more in progress, and twelve additional lists planned after that. These lists are located at www.worldseed.org under Trade Matters, under databases.

PPQ organization, services, and processes

Is there a flowchart of all of your groups and how they fit together?
Go to the APHIS website > Plant Health > Program Overview, located here.

There are inconsistencies with interactions with Export Specialists among different states.
There has been a concerted effort this year to ensure that Export Certification Specialists (ECS's) are aware of the policies and how they should be interpreted. ECS's are geographically isolated now; PPQ is looking into having ECS's review phytos on a commodity basis, to decrease inconsistent applications of

measures due to geography. PPQ-Export Services has biweekly calls with ECS's to go over all policies, raise issues, and enjoy two-way communication. As the training is moved online for certifying officials, hope the ECS's become more involved in addressing day-to-day issues, like reviewing phytos and providing feedback.

SPHD's can contact cooperators for feedback on how the ECS's in their state are doing.

If you find a previously unknown virus, where do you go with that information? How does federal government want to deal with this? We need a flowchart of where to go and who to talk to.
Anytime a new pathogen is found, notify your state plant health director and then it will go up the chain.

Situation with Canada, find nematode in Alberta, shut the door on them, now during our process of doing traces and sampling, come up with unknown. Can't take an action unless you can classify it and establish its status.

Regarding the *Phomopsis* issue, spinach seeds from Denmark were stopped at the border. After two years, we haven't encountered the fungus on spinach seeds again, but we have yet to see diagnostic information. How long does that normally take and what's the process look like from start to finish?
In that case, the identification was done morphologically and confirmed using sequence analysis. There were multiple species involved, not all were present in the United States. PPQ is working with DuToit on this ongoing issue.

As for the process, CBP does the inspection and turns in the interception to local identifier, who refers it to the National Identification Services (NIS) for final identification. A morphological identification is made within 24 hours. In the *Phomopsis* case, molecular diagnostics were also done. Other discussions and testing take up the most time. There is no one answer, when the situation gets more complicated than making an identification and then making a determination on the interception.

There has been a lot of reference to trade directors and a strategic approach to all the different aspects of trade. Where does the seed industry fall in that priority list and how do we raise it?
Regarding import access to the United States, the perception is that there isn't enough being done currently and something needs be done, preferably take a non-regulatory approach. On export side, we are reacting to what other countries are requiring of us. Trade directors' work encompasses more than seed issues and the way that work is prioritized differs by region and by individual. We do consider the market potential for new access of different products and impacts on other associated products.

APHIS has been proactive in planning for budgetary challenges. What we see on the horizon is relatively positive. Common wisdom suggests that we hit bottom in 2012-2013 and Senate and House recognized the value of APHIS with an increase in APHIS budget in FY14. Recognizing that one of the sectors of U.S. economy that we can and should impact is exports. Will be hiring more people to increase exports.

How to raise the profile:

- Get your issues into different fora and dialogues related to international trade, like the WTO SPS committee and trade barrier reports.
- When USTR launches free trade talks with the UN or ASEAN, they tend to send out a federal register notice soliciting comments from stakeholders. That is a great place to work your issues into their agenda and priorities.

Emerging technology and its consequences

It's predicted that there will be a flood of information in 5-10 years about diseases associated with seed due to advances in deep sequencing. How is APHIS preparing for that?

Deep sequencing is a new process, but the problems that arise from it are not new. In a trade environment, countries are under an SPS agreement that states that measures must be based on evidence. If there is wide agreement among specialists about what the particular evidence is saying, then we'd have to review it.

Hope that we maintain common-sense approach, before we go crazy with new regulations or requirements, make sure that we look at new info and know what it really means. Top-tier journals are requiring evidence of causality in order to publish. New technology does not substitute for the final experiments to show causality of disease.

Definition of a quarantine pest is incredibly complicated, but the key is that it causes economic damage. There HAS to be indication that it is a pest.

Recently developed technology is something that is in on the National Clean Plant Network's radar, who will see this hit germplasm and stock sooner than seeds. It's yet too soon to understand the impact, but it is on the radar.

Seed Health Summit
July 15-17, 2014
Agenda

Purposes of the summit:

1) Imports
   a) To discuss issues and risks related to importing seeds.
   b) Determine possible next steps (regulatory and non-regulatory) to address specific seed-transmitted disease issues and risks related to importing seeds.
   c) Use experiences shared at the summit to begin developing overall joint strategies
2) Trade: To begin developing practical strategies to address trade concerns related to the international movement of seeds.

Products: An agreed-to list of immediate next steps and plans to address issues related to seed health, imports and trade.

Day One: Imports (Tuesday, July 15, 2014)		
8:30 AM	**Welcome/Keynote Addresses**	Shailaja Rabindran, Mike Gregoire, Osama El-Lissy, Wayne Dixon, Ric Dunkle Facilitators
9:40	**BREAK**	
10:00	**Case Study I: Cucumber Green Mottle Mosaic Virus (CG**MMV)	Bob Bailey, Betsy Peterson
11:00	**Case Study II: Soybean Rust**	Russ Bulluck
12:00	**LUNCH**	
1:00	**Case Study III: Wheat Blast**	Carissa Marasas, Jim Peterson
2:00	**National Seed Health System Overview**	Gregg Goodman, Darrell Maddox
2:45	**BREAK**	
3:00	**Seed Transmitted Disease—Framing the Problems**	Everyone (small table groups)
5:00	**Adjourn**	
Day Two: Imports (Wednesday, July 16, 2014)		
8:30 AM	**Recap of First Day of the Summit**	Everyone
9:00	**Seed Transmitted Disease—Framing the Problems (continued if needed)**	
10:00	**BREAK**	
10:20	**Developing Potential Solutions**	Everyone (small table groups)
11:00	**Addressing the Challenges for Specific Issues** Purpose: to come up with the top priority ways to address the top challenges for particular issues to be addressed at the Summit In table groups focused on specific diseases, work on plans	Everyone (small table groups)

	to address the following seed transmitted diseases with improved import policy and actions to be taken by PPQ, States, Industry, Universities and Growers • *Wheat*: Wheat blast • *Cucurbits*: CGMMV • *Solanaceous seeds*: Potato spindle tuber viroid (PSTVd) Tomato apical stunt viroid (TASVd) (and other pospiviroids) • *Corn:* Corn late wilt (*Harpophora maydis*) and Downy mildews on corn (So. Africa) • *Rice: Xanthomonas oryzae* on rice	
12:00	**Lunch**	
1:00	**Addressing the Challenges for Specific Issues (continued)**	
2:40	**BREAK**	
3:00	**Addressing the Challenges for Specific Issues (continued)**	
4:15	**Wrap up and next steps (includes summary of suggested strategies)**	Mike Watson and Bill Thomas
5:00	**Adjourn**	
Day Three: Trade (Thursday, July 17, 2014)		
8:30	**Opening remarks**	George Galasso, Osama El-Lissy, Christian Dellis, Ingrid Watson, Ric Dunkle, Facilitators
9:00	**Panel Discussion—Government Resources for Trade Issues**	Galasso, Dellis, Erikson, Gutierrez, Devorshak, Nichols, Scott, Dixon
10:00	**BREAK**	
10:20	**Panel Discussion—Government Resources for Trade Issues (continued)**	
11:00	**Export/Trade Questions and Concerns**	
11:30	**Raise the Export/Trade Related Questions and Concerns with the Panel**	
12:00	**LUNCH**	
1:00	**Raise the Export/Trade Related Challenges with the Panel (continued)**	
2:00	**Address any other concern related to seeds, import regulations, or trade**	
3:00	**BREAK**	
3:20	**Address any other concern related to seeds, import regulations, or trade**	
4:15	**Wrap up and next steps**	Mike Watson and George Galasso
5:00	**Adjourn**	