Offshore Geranium Cuttings Production Program

A Pathway Mitigation Partnership between APHIS and the Geranium Industry

Continental Dialogue
October, 2010 Meeting

Background…

- *Ralstonia solanacearum,* Race 3, Biovar 2: a U.S. quarantine pest
- It's a bacterial pathogen.
- Hosts include: geraniums, potatoes, tomatoes
- Potato industry in northern states very concerned because R3B2 apparently can over-winter

So why is Ralstonia a problem?

- It's in the soil and water of much of the world. But not in the U.S. or Canada.
- Geranium cuttings, produced "offshore" (outside the U.S.) could carry R3B2 back into the U.S.
- But geranium offshore production is an important part of the flower economy – both in the U.S. and in other countries

R3B2…

- Serious Pest
- Worldwide distribution
- Wide host-range
- Survives in the soil
- Spreads via water
- Infection through roots, injuries (knives)
- Threat to the Industry

Why would the industry think it could propose “certification” ?

Because…

INDUSTRY HAD ALREADY DEVELOPED AND IMPLEMENTED AN INDUSTRY-WIDE SYSTEMS APPROACH

Systems approach?? What is it?

Systems approach:

Usually refers to a “HACCP” (Hazard Analysis of Critical Control Points) type approach…..

Based on the initial industry presentations, APHIS agreed to work with industry on a program

The current program primarily consists of those industry-developed standards, with some tightening and fine-tuning to address APHIS' science and regulatory concerns.

"SYSTEMS APPROACH": An often-heard answer to pest & disease questions

TO BE SUCCESSFUL, A SYSTEMS APPROACH MUST BE BASED ON COMMON, ACCEPTED INDUSTRY PRACTICES

Industry-used practices must come first – then regulatory concerns added. Not vice-versa!

“SYSTEMS APPROACH”: An often-heard answer to pest & disease questions

AND “SYSTEMS APPROACH” IS NOT THE ANSWER TO EVERYTHING!!

We have other tools….

Bacterial Blight of Geranium

Xanthomonas campestris pv. pelargonii (Xcp)
A MAJOR GERANIUM DISEASE.

- Systemic pathogen
- Vascular wilt
- Leaf spotting
- Attacks Pelargonium and Geranium spp.
- No chemical cure
- Clean stock is the only answer

Southern Wilt of Geranium

Ralstonia solanacearum Race 3 Biovar 2 (RsR3B2)

- Systemic pathogen
- Vascular wilt
- No Leaf spotting
- Healthy roots
- Attacks potatoes, tomatoes, geranium and others.
- Race 1 to geranium

Clean Plant Production

- Repetitive testing (culture and virus indexing multiple times over year)
- Annual stock renewal
- Unidirectional flow of cuttings and people (work from clean to dirty, no backward flow of cuttings)
- Isolation
- Sanitation (tight sanitation to prevent reintroduction of disease)

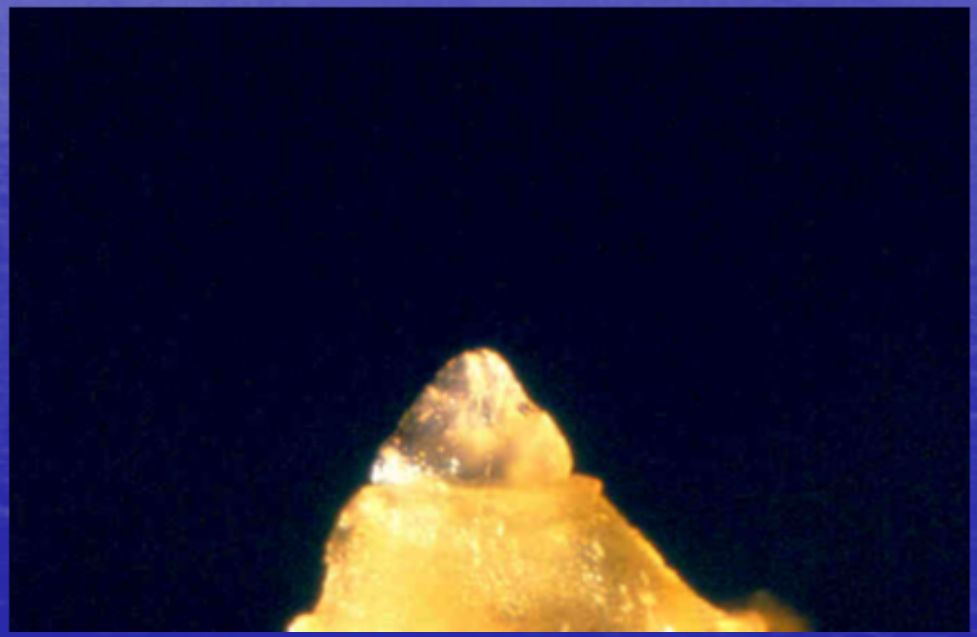
Geranium Production Flow Chart

Culture Indexing

- Eliminates systemic fungal and bacterial pathogens (i.e. Xcp)
- Laboratory process
- Test stock grown under conditions optimal for disease development

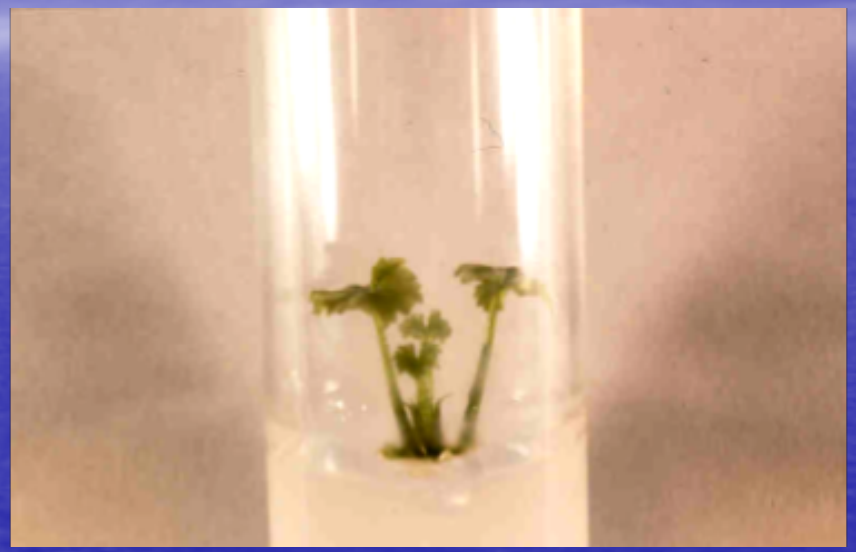
Virus Elimination

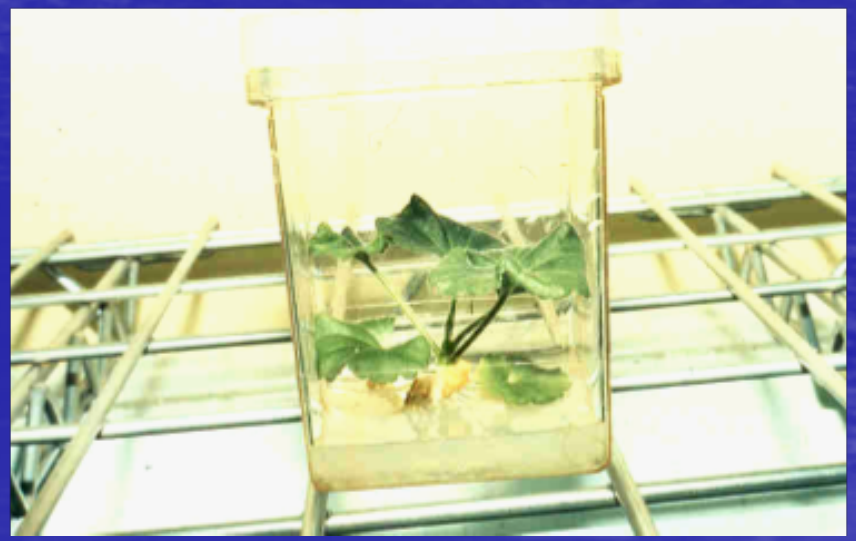
- Thermotherapy (heat treatment)
- High temperatures lowers virus titer
- Meristem tip removal
- Tissue culture of meristem tip



Tissue Culture

- Meristem tip removal
- Tissue culture
- Shoot regeneration
- Root regeneration
- Transplant to greenhouse





Geranium Production Flow Chart

WHAT ARE KEY COMPONENTS OF CERTIFICATION PLAN OFFSHORE?

- Greenhouse Structure and Materials
- Water Source and Treatment
- Growing Media Source and Treatment
- General Sanitation Requirements
- Scouting and Testing
- Trace Forward/Trace Back Reporting (unrooted and rooted cuttings)

Greenhouse Requirements

- Polyethylene or rigid covering
- Metal or wooden frames
- Individual growing sections or units
- 20,000 to 50,000 plants per section

Greenhouse Entrance

Entry to each Unit has:

- Double door entryway
- Clean water
- Soap
- Hand disinfectants
- Foot bath
- Protective clothing

Greenhouse Benches & Floors

- Stock must be raised off ground
- No water contact from pot to pot
- Floors weed-free
- Well drained
- Concrete -- or gravel covered with saran
- No bare earth, no puddles!

Irrigation

- Bags/pots for container
- Drip irrigation
- No subirrigation
- No backflow

Weed Control

- No weeds inside
- Weed free border surrounding houses

Growing Media

- “Soilless” is norm
- Volcanic rock (scoria)
- Steam pasteurized
- Or fumigated

Water Source

- Deep wells
- Pond/Lake only if treated first
- UV or chlorination
- Fertilizer injectors

And there must be a back-up!

Worker Sanitation

- Training
- Wash Station procedures
- Handwash with soap
- Hand disinfection
- Lab coat/apron
- Footbath

Harvesting

- Knife disinfection
- Hand disinfection
- Clean bags/boxes
- Clean packing shed

Barcode Scanning for Tracing

- Each QC tag has unique barcode
- Identifies variety
- Identifies greenhouse
- Identifies Ship Week
- Identifies harvester
- Troubleshooting
- Unrooted and rooted cuttings

House

Ship Week

Unique Number linked to Bag Only # Needed for Reference

Trace Forward/Trace Back

If Rs is discovered in U. S.:

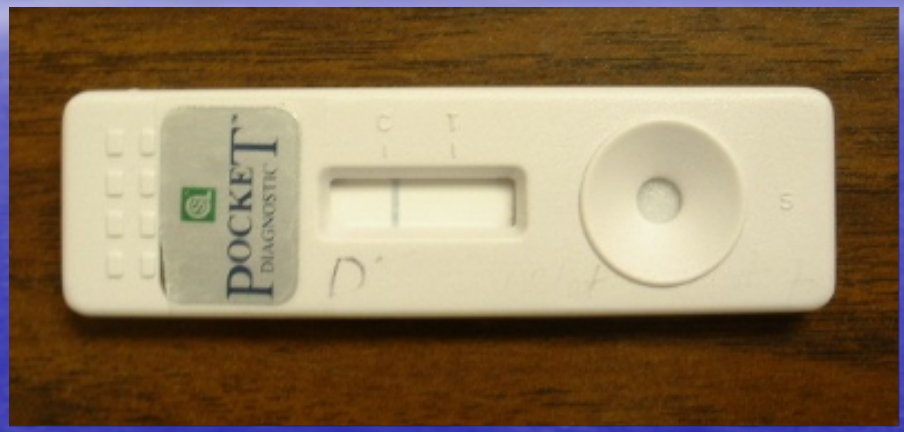
- Trace back to farm
- Trace to variety and greenhouse
- Greenhouse stock is destroyed

If Rs is discovered at Farm:

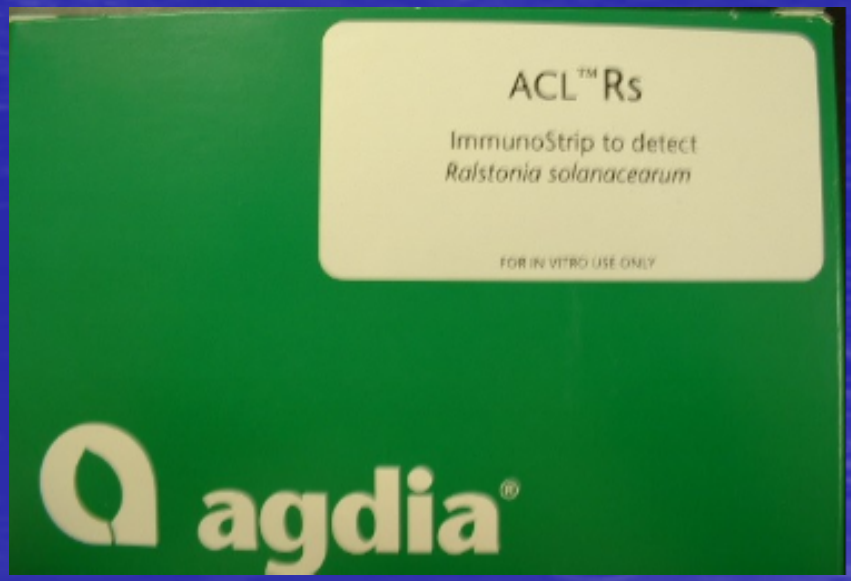
- Trace forward to customer(s)
- Scout, test and destroy when necessary

Scouting and Testing at Farms

- Weekly scouting for suspect plants
- Weekly inspections by Ag authorities
- Weekly testing for Rs using CSL or Agdia test (plants/water)
- Maintaining test records, traceback info for one year



Potato Brown Rot Pocket-CSL



OTHER KEY POINTS

- Regular cleaning of production houses
- Annual renewal of stock at all levels
- Complete facility disinfection prior to new season

OFFSHORE PRODUCTION FACILITIES

- Canary Islands (Spain)
- El Salvador
- Ethiopia
- Germany (all nuclear stock)
- Guatemala
- Kenya
- Mexico

And more coming…

Netherlands, Tanzania, Uganda.

Israel?

WHAT DOES U.S. GOVERNMENT DO?

- Oversees the Plan
- Sends USDA inspectors to each offshore greenhouse for inspection, once annually
- Works with industry and foreign governments to resolve any problems or questions

WHAT DOES THE FOREIGN GOVERNMENT DO?

- Signs the “Work Management Plan” with the U.S. government
- Weekly scouting
- Weekly testing
- Issues phytosanitary certificates for shipment back to the U.S. (or to other countries)

WHO BENEFITS FROM THE PROGRAM?

FOREIGN COMPANIES: because geranium production can continue offshore for shipment into the U.S., employment and other economic benefits continue offshore.

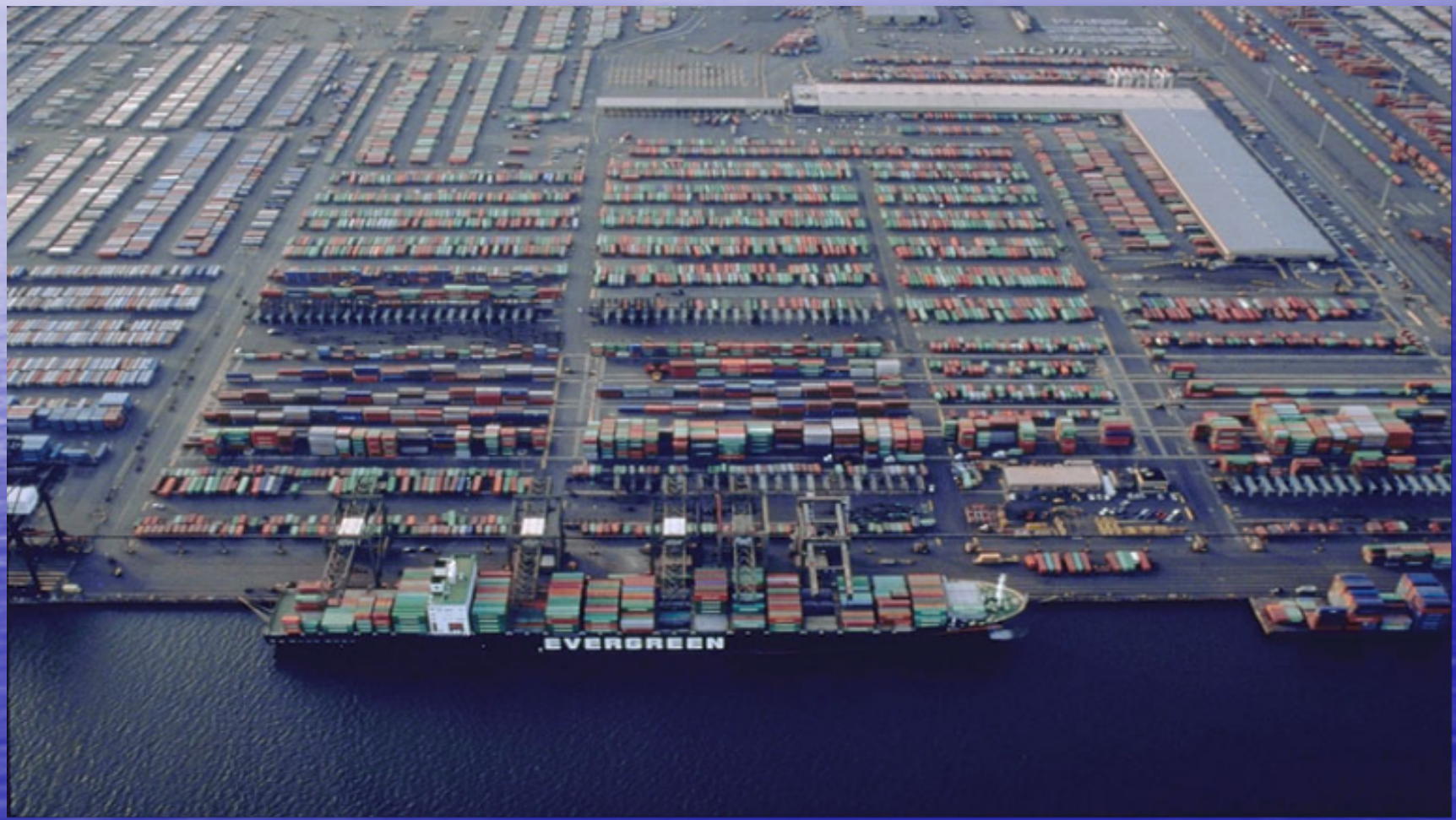
U.S. COMPANIES: geraniums continue to be available and sold in the U.S. without disrupting the market system

GOVERNMENTS: industry cooperates and takes responsibility

What has changed in international trade?

- Importation of ornamental cuttings has increased 500% from 1992 to 2002
- Over 500 million cuttings are imported into the U.S. per year
- Consumers are demanding new varieties
- And plants are not the only pathway…

The Port of Long Beach… who's looking at all this stuff?



What Does This Mean?

There is no one answer …

Systems approach: one solution

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Mike Klopmeyer, Ph.D., Ball Horticultural Company, West Chicago, Illinois

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