



Evaluation of the USDA/APHIS United States Nursery Certification Program (USNCP)

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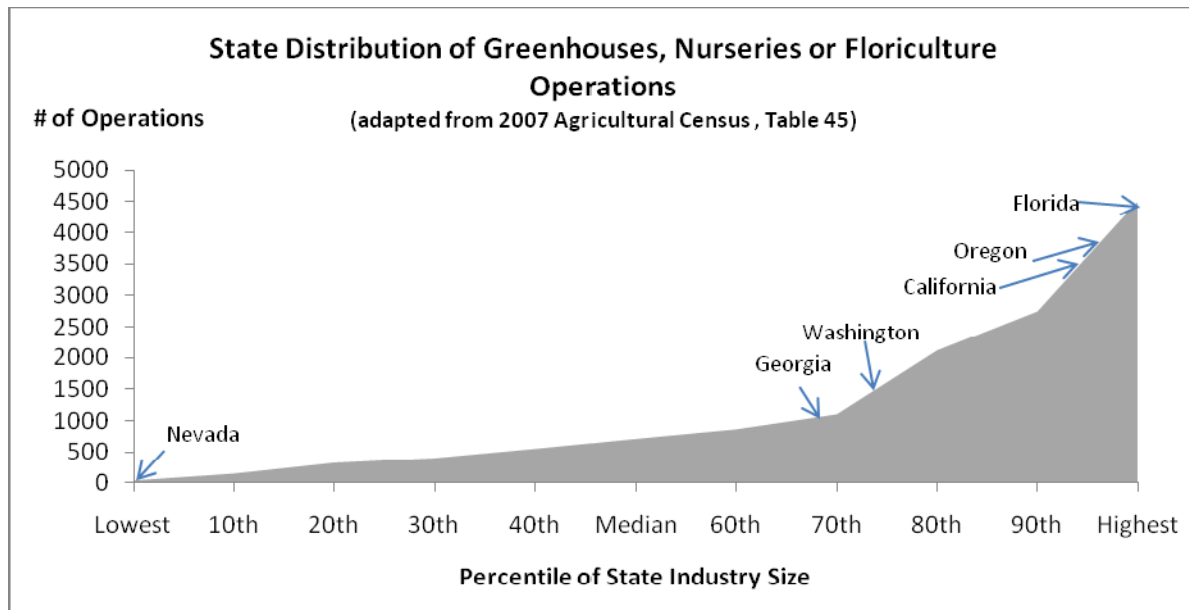
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INTRODUCTION

Background

According to Table 45 of the 2007 Census of Agriculture, there were 54,889 farms classified as “Greenhouse, nursery, and floriculture production (1114)” in the United States (US). As Figure 1 demonstrates, the size of the nursery industry across states varies significantly. Nevada, with 41 operations, and Florida, with 4,492 operations, represent the two extremes. The seven pilot nurseries of the U.S. Nursery Certification Program are located in the states of California, Georgia, Oregon, and Washington – four of the eighteen states with more than 1,000 operations.

Figure 1: Distribution of Greenhouses, Nurseries or Floriculture Operations by State



The Horticultural Research Institute (HRI) commissioned an independent, third party evaluation of the US Nursery Certification Program (USNCP). They contracted with Dr. Kathryn Newcomer, Director of the Trachtenberg School of Public Policy and Public Administration at The George Washington University, to design and direct the evaluation. HRI requested that the evaluation collect and document the perspectives of key stakeholders including the pilot nurseries, Animal and Plant Health Inspection Service (APHIS) staff, state department of agriculture staff, phytopathology researchers, and others as deemed appropriate. HRI requested an assessment of the program’s effectiveness to date, recommendations regarding the expansion of the program including the development of a national training program, and suggestions for how to evaluate the program moving forward. This report provides findings and recommendations on each of these elements.

The US Nursery Industry is regulated by the United States Department of Agriculture (USDA) and the state and local departments of agriculture in which each nursery is located. The USDA focuses its attention primarily on import/export issues to facilitate trade across national borders. The state/local departments of agriculture determine the standards of operation for nurseries within their jurisdictions

and set the requirements for inter-state trade. The regulatory agencies work together directly on issues that cross state boundaries and through organizations such as the National Plant Board (NPB) and the National Association of State Departments of Agriculture (NASDA). Although both organizations have state regulators as members, the NPB membership is comprised of principal plant pest regulatory officials – like pathologists and entomologists, while NASDA members tend to be the chiefs of their state regulatory agencies. There are also four regional plant boards – eastern, southern, central, and western – that contribute to discussions and solutions.

USDA's APHIS heads up trade facilitation through its Plant Protection and Quarantine (PPQ) unit. Their focus is on exports to other countries. Prior to the formation of the Department of Homeland Security (DHS) they also dealt with imports, but DHS is now responsible for all ports of entry. It is the responsibility of APHIS-PPQ to ensure that all plants cleared for export meet the requirements of the country to which they are being exported. APHIS-PPQ largely delegates this authority to the state/local departments of agriculture for exports to Canada. APHIS-PPQ works closely with Canada and Mexico through the North American Plant Protection Organization (NAPPO). Regulatory agreements made through NAPPO are called Regional Standards for Phytosanitary Measures (RSPMs). International standard setting is partially guided by the International Plant Protection Convention (IPPC) which is supported through the United Nations. Regulatory agreements established through IPPC are called International Standards for Phytosanitary Measures (ISPMs).

For those nurseries not participating in the USNCP the typical approval process for clearing a shipment to Canada involves obtaining a federal phytosanitary certificate per consignment items. Obtaining a phytosanitary certificate (phyto) requires that nurseries contact their local/state department of agriculture to schedule an inspection of the plant materials prior to them being loaded onto the truck. The number of days notice required to secure an inspector depends on the state. In addition, the import requirements of the Canadians require that some states conduct additional lab testing of plant materials prior to approval. For example, certain nursery plants coming from Georgia must be tested for nematodes prior to export which can take approximately one week. When the inspector arrives on-site, he or she visually inspects the plants for pests and diseases. The inspector approves the plants on an individual basis and issues a phyto for the plants that have been approved for export. At that point the nursery is free to load the truck and send it to Canada.

In the last couple of years, APHIS has created an electronic phytosanitary certificate that has expedited this export clearance process. The new system, called Phytosanitary Certificate Issuance & Tracking (PCIT), enables nurseries to enter the plant materials they expect to export into a web-based computer system. The local/state department of agriculture downloads this information before arriving on-site for the inspection. The inspection process continues as described above except that the inspector does not have to hand-write the phytosanitary certificate while on the premises. Instead, the inspector signs the pre-printed certificate when the inspection is complete. APHIS has been phasing this system in since 2005. An APHIS presentation made at a conference in Canada (May 2009) indicates that 4,472 companies have used the system so far (<http://www.nappo.org/E-Cert%20Symposium5-09/E-CertWorkshop-e/Presentations/ChristianDellisUSPCIT.pdf>).

The United States Nursery Certification Program (USNCP) offers an alternative method of approving exports to Canada and of obtaining the phytosanitary certification. This is discussed in the next section.

Overview of USNCP

The USNCP is a pilot program administered by the Animal and Plant Health Inspection Service (APHIS) of the United States Department of Agriculture through the Plant Protection and Quarantine (PPQ) unit. Within each state, the program is jointly implemented by APHIS staff and state/local co-operators depending on the Department of Agriculture structure. APHIS staff involved in the administration of the program are Export Certification Specialists and Trade Specialists assigned at the state and regional levels in addition to staff at Headquarters in Riverdale, Maryland.

According to the [Questions and Answers](#) document produced by APHIS, the US Nursery Certification Program is: “a phytosanitary certification program for US nurseries that ship nursery stock to Canada. The USNCP uses a Phytosanitary Management System (PSMS) to minimize pest risks so that plants consistently meet Canadian import requirements. The program offers “an alternative to traditional phytosanitary certification for shipments to Canada” (supplied by an APHIS staff member July 12, 2010). The USNCP is designed to allow participating nurseries to self-certify that their plants are free of pests and diseases prior to shipment to Canada. The USNCP allows nurseries to become approved to create their own phytosanitary certificates through the PCIT system and does not require inspectors to come on-site to review their plants just prior to export.

Although the [Questions and Answers](#) document identifies the start date of the USNCP Pilot as 2006, conversations with APHIS officials, state co-operators, and participating pilot nurseries situate the start date between 2003-2007. Undoubtedly not everyone has the same definition of what “program start date” means. The state co-operators and nurseries in the two states where the pilot first began, talk about the start of the program in terms of when they began to help conceptualize the program. Perceptions of why the program was started, the direction it has been moving, and the potential benefits of the program are similarly divergent, and are discussed in the Findings section later in this report.

As a pilot, the USNCP allowed the nomination of up to four nurseries per state for initial participation. APHIS asked that industry groups make the nominations. Discussions with individuals in the pilot states indicate that this was the process followed. Study respondents also indicate that during the initial stages of the USNCP, a team of APHIS staff members came to the states to make a pitch for participation to the industry groups.

The USNCP was created around the model of a “systems approach.” A systems approach focuses on plant health through the processes and stages of nursery plant production rather than focusing on just the end plant product. The systems approach could allow the detection of pests earlier in the life-cycle of the plant and may be able to prevent or detect pests that could not be seen at an end-point inspection. The International Plant Protection Convention (IPPC) encourages the use of a systems

approach for pest risk management through ISPM 14 (See Appendix A for a link to the full standard). RSPM 24, created by the North American Plant Protection Organization (NAPPO), outlines the standards for the pest risk management approach that Canada, Mexico, and the United States agreed to implement. The USNCP represents the operationalization of ISPM 14 and RSPM 24 for implementation of a phytosanitary systems approach for exporting nurseries in the United States.

Participation in USNCP requires the following:

- (1) Nurseries must identify each of the processes and stages in their nursery where plant health may be affected
- (2) Nurseries must create systems for tracking plant material through each of these stages and processes (often discussed as traceability)
- (3) Nurseries must designate particular staff to particular roles regarding the maintenance of plant health (at least two people are required although contractors may be used); there must be a Certification Manager and a Pest Control Advisor/Manager
- (4) Nurseries must create a regular scouting program to continuously review plant health
- (5) Nurseries must identify remediation strategies for the pests most likely to be problematic for their plants
- (6) Nurseries must create policies and procedures on how they plan to handle requirements (1)-(5)
- (7) Nurseries must regularly train staff on plant health threats and the nursery's policies and procedures for dealing with them
- (8) Nurseries must record their policies and procedures in a USNCP Manual that conforms to the template and requirements provided by APHIS
- (9) Nurseries must conduct internal audits to verify they are following their own policies and procedures
- (10) Nurseries must document their compliance with their own policies and procedures as they appear in the manual
- (11) Nurseries must maintain their documentation for three years
- (12) Nurseries must complete an initial on-site audit that verifies policies, procedures, and facilities are sufficient for pest mitigation (they may be required to make changes to their manuals or their facilities if APHIS determines they are not sufficient)
- (13) Nurseries must participate in multiple on-site audits each year by APHIS and state co-operators to verify compliance with the policies and procedures contained in the manual and to verify that the property remains pest free.

The USNCP requires that participating nurseries pass through three certification stages. *Initial Certification* is the first step of being accepted into the USNCP. It signifies that the nursery has a manual that has been approved by APHIS and it has passed an initial systems audit. The *Initial Certification* stage lasts for one year and requires successful completion of four surveillance and one systems audit. *Conditional Certification* is the second stage of the USNCP process. The *Conditional Certification* period lasts for one year and requires successful completion of three surveillance and one systems audit. Finally, by their third year of participation nurseries reach *Standard Status* if they have been successful in all their audits. Once reaching *Standard Status*, nurseries continue to have two surveillance audits

and one system audit per year. Nurseries may be placed back in *Conditional Certification* if an audit reveals a significant nonconformance (a significant violation of policies/procedures) or they experience an uncontrolled pest infestation. While all the pilot nurseries have achieved *Standard Status*, only four of the seven indicate that they have been able to issue their own phytosanitary certificates. The pilot nurseries that cannot do so are not sure why they have not been allowed to issue their own, and their certification level does not immediately reveal the reason.

Discussions with APHIS and state regulatory staff indicate that sometimes nurseries may not be able to issue their own phytosanitary certificates because they are exporting “mixed loads” of plants to Canada. That is, USNCP only covers certain plants because Canada requires an individual certification for plants with particular quarantine concerns. The USNCP covers plants considered nursery stock – “any plant for planting, propagation or ornamentation including greenhouse, containerized and field grown plants; not seed.” Barberry was mentioned a number of times as a plant that nurseries are likely to ship to Canada, but is not covered under the USNCP.

The USNCP is one of many programs run by APHIS-PPQ in pursuit of their goals to ensure the health of plant materials and facilitate international trade. During the course of this study, the researchers learned that APHIS plans to collapse the US Greenhouse Certification Program under the USNCP in the future. We attempt to address this proposed action in our recommendations.

Pilot Nurseries and States

As of the time of this study, seven nurseries were participating in the USNCP Pilot: 1 in California, 1 in Georgia, 4 in Oregon, and 1 in Washington. The pilot nurseries represent a diversity of nursery growing methods (bare root, container, tissue culture), but they tend to be some of the largest nurseries in the business. Data provided by the nurseries indicate that (See data collection form used in Appendix D):

- Their approximate 2009 sales ranged from \$2.2 million to \$39.6 million.
- Their typical staff size during 2009 was 16 to 688 employees.
- Their crops in the open ranged from 25-1,500 acres.
- Their crops under protection ranged from 0-9.4 million square feet.
- They exported approximately <1% to 13% of 2009 sales to Canada.

Despite the apparent range in the size of the pilot nurseries, even the smallest of these nurseries has 2009 sales that are approximately seven times the size of the average value of sales per greenhouse, nursery, or floriculture operation in 2007 (Census of Agriculture, USDA). This raises some concerns about how the experiences of pilot nurseries translate to a “typical” nursery operation. These issues of comparability are addressed later in the report.

All seven of the pilot nurseries indicated that they were able to fill the required role of Certification Manager through an existing staff position. Six of the seven pilot nurseries indicated they were able to

fill the role of Pest Control Manager/Advisor by absorbing it into existing staff positions. One of the pilot nurseries found it necessary to hire a contractor to serve in the Pest Control Manager/Advisor position. Four of the seven pilot nurseries have experienced turnover in either the Certification Manager or Pest Control Manager/Advisor positions since enrolling in the program.

Three of the pilot nurseries are affiliated with each other: 1 in Oregon, 1 in California, and 1 in Georgia. The nurseries in California and Georgia were encouraged to enter the program by top management in the company that had deemed the USNCP a benefit to the operation in Oregon. The California and Georgia sites were able to build from the work that the Oregon site had already done.

Nursery Industry Context

According to the 2007 Census of Agriculture: Greenhouse, Nursery, and Floriculture operations (USDA):

- Nursery stock had a total sales value of \$6.6 billion in 2007
 - The average value of sales per greenhouse, nursery or floriculture operation was \$309,117
- Nursery stock was planted on 446,496 open acres and crops under glass or other protection covered 221,813,698 square feet.
 - The average size of operations was 72 acres.

The evaluation team requested data from APHIS regarding the number of nurseries per state that export USNCP-type plants to Canada and the number of phytos issued for nursery plant export for Canada in a given year. We were told that “those data cannot be obtained from the current records.” We understand that prior to the implementation of the electronic PCIT system that exporting of plants to Canada was tracked through hand-written forms. Perhaps as use of the PCIT system becomes more pervasive and regular, these data will be available. The evaluation team was able to obtain some estimated data from the state departments of agriculture in Oregon and Washington during our on-site interviews with them. This information is depicted in Table 1.

Table 1: Profile of the Nursery Industry in Oregon and Washington

Nursery Characteristics*	Oregon	Washington
# of State Inspectors	12	11
# of Licensed Nurseries	6,000	6,000
# that ship out of state (approximate)	5,100	150
# that export to Canada (approximate)	400-500	30
# of Nurseries participating in USNCP Pilot	4	1

*Data are approximations provided by state regulatory staff during the interviews.

SCOPE AND METHOD

Evaluation Design

The purpose of this evaluation is to assess the benefits, challenges, and costs of the USNCP Pilot Program from the perspectives of its participants and key stakeholders. This is not a summative or impact evaluation, but rather a formative evaluation – that is the assessment focuses on what information can be gained about actions taken so far that may inform action that will be taken in the future.

Stakeholders of the USNCP are: (1) the pilot nurseries, (2) the non-participating nurseries, (3) the intermediary organizations representing the nursery industry, (4) state and local government departments of agriculture in pilot states, (5) state and local government departments of agriculture in non-participating states, (6) APHIS, (7) the countries to which the plants are exported (although this program focuses on exports to Canada, other countries are still stakeholders), and (8) US society as a whole. Data collection focused on stakeholders in groups (1), (4), and (6). Interviews were also conducted with individuals in groups (2), (5), (7), and (8).

As a formative evaluation, this study sought to uncover not only the actualized benefits, challenges, and costs connected with the pilot program, but also the potential benefits, challenges, and costs of an expanded or modified program. The actualized and potential benefits, challenges, and costs expressed in this study are based on data collected through interviews with 45 key stakeholders (as of 11/8/10). Existing data about the nursery industry have been used where available at the national level, but requests for information indicate that much of the desired and needed data are: 1) not collected or 2) not accessible for analysis.

It would be extremely useful to know what percent of all eligible nurseries participated in the pilot and how many nurseries are likely to be eligible for participation in the future both nationally and on a state by state basis. It does not appear, however, that such data will be available during the timeframe of this study.

Data Collection Methods

Data were collected through four primary methods: analysis of documents, interviews of key stakeholders, participant-observer interactions, and through information requests to government agencies. Key stakeholders in Oregon and Washington were interviewed on-site, while most of the remaining stakeholders were interviewed by phone.

First, the evaluation team reviewed documents describing the USNCP program. These documents consisted of the USNCP Pilot Manual, USNCP Questions and Answers, and the USNCP Accreditation/Certification Program Questionnaire. Using information gleaned from these sources, answers to an initial set of questions posed to APHIS headquarters staff, and information from the 2007

Census of Agriculture, the evaluation team crafted semi-structured interview questions and pilot nursery data forms (See Appendix D for additional data collection information).

Next, interviews of key stakeholders were conducted in two waves. In the first wave, the evaluation team from George Washington University conducted in-person interviews with 24 representatives of the pilot nurseries, the state departments of agriculture, APHIS staff assigned to Oregon and Washington, and other related individuals between July 30, 2010 and August 3, 2010 as follows:

- 14 representatives of 5 pilot nurseries, 4 in Oregon and 1 in Washington
- 6 representatives of state departments of agriculture, 3 in Oregon and 3 in Washington
- 2 representatives of APHIS, 1 in Oregon and 1 in Washington
- 2 phytopathology researchers

In the second wave of key stakeholder interviews, the evaluation team from George Washington University conducted phone interviews with 14 representatives of the pilot nurseries, state and county departments of agriculture, a Canadian CFIA official, and APHIS staff assigned to Georgia, California, regional and headquarters positions between August 17, 2010 and November 8, 2010 as follows:

- 4 representatives of 2 pilot nurseries in Georgia and California
- 1 representative of a nursery that started but did not complete pilot enrollment
- 1 private consultant who has assisted some of the pilot nurseries in preparing for USNCP participation
- 1 representative of a state department of agriculture
- 1 representative of county department of agriculture
- 5 representatives of APHIS, 3 in California, 1 in Georgia, 2 in regional positions, and 1 at headquarters
- 1 representative of the Canadian Food Inspection Agency (CFIA)

In each of the interview waves, interviewees in the nursery industry were identified and introduced to the evaluation team by HRI. Likewise, the primary APHIS contact identified and introduced the evaluation team to federal and state officials in each state, and Canadian officials. From those first levels of introductions, the list of individuals to interview grew through a snowball approach. We asked both the nurseries and the state/local departments of agriculture to identify individuals who participated in the auditing process and individuals who were managers of units where the auditing took place. Frequently more than one individual from an organization was interviewed. We provided interviewees within the same organization an opportunity to meet with us individually or as a group.

Soon after the second wave of interviews began, one member of the evaluation team attended the Audit Training in Raleigh, NC as a participant-observer August 25-26. This was an introductory audit training class for APHIS PPQ staff and state department of agriculture staff. The evaluator attended the class and engaged in the same activities as the other participants, while at the same time making notes comparing what was discussed in the training to what had been learned from the interview process so far. While at the training, the evaluator conducted informal interviews with two representatives of APHIS and representatives of four state departments of agriculture in states that currently have no nurseries participating in the USNCP pilot.

Finally, the evaluation team requested data about the nursery industry, particularly export data from APHIS. The team was told that most of the data “could not be obtained from current records.”

Potential Limitations of Data and Analysis

Interviews have the potential to generate biased or inaccurate information. Respondents may not correctly recall events or may attempt to intentionally mislead interviewers. Interviewers may also misinterpret what they are hearing. Obtaining information from multiple respondents is one way to counteract these potential problems.

It is the perception of the evaluation team that the interviewees were candid in their responses. They tended to provide both positive and negative reflections on the USNCP, expressed hopes and frustrations, and frequently provided significant background and context for the discussion to the evaluators because they wanted to be sure that we understood the importance of what we were studying. They generally provided us with far more information than we requested.

In addition, where the perceptions of interviewees do not match information about how the program is supposed to work is itself important data for evaluating the status of the program. The expressed confusion of interviewees leads to many of the findings and recommendations of this report.

Ideally, it would be desirable to have data to compare conditions “before” and “after” the implementation of the pilot program. For example, these data could help answer questions like – Is the nursery stock cleaner? Does the USNCP make a measurable difference in transfer of pests from the United States to Canada? Unfortunately there were no data collected to measure these changes by either the United States or Canada. Even if there were such data, it would be impossible to infer that benefits found in these pilot nurseries would also be experienced in other nurseries because the pilot nurseries were not randomly selected and are clearly not representative of their field. Still, the experience of the pilot nurseries does point to some important learning implications for the future of the USNCP.

FINDINGS

All interviewees were asked a core set of questions: What is your role in the USNCP? What do you see as the benefits of participation? What do you see as the challenges to participation? Participating nurseries were also asked whether they had to spend any money to get the USNCP started and whether it had ongoing costs for them. Many of the interviewees were asked what they would recommend if the USNCP were to be expanded.

1. Stakeholder groups have varying perceptions of the reasons that the USNCP was created and its purpose.

Perceptions of why the USNCP was created

There are three prevailing thoughts about why the USNCP was created. One group of individuals thinks that APHIS was pushed to create the systems-focused USNCP by Canadian trade officials. Another group believes that APHIS created the USNCP at the request of the nursery industry, especially the Oregon Nurseryman's Association (OAN). Finally, a third group perceives the creation of the USNCP as a convergence of both of these forces – Canada's wish that the U.S. would move towards a systems-approach and the nursery industry's interest in pursuing it.

Among those involved in getting the USNCP Pilot off the ground – nurserymen, state department of agriculture officials, and APHIS officials, the story of USNCP start-up is fairly similar. At one point there was a president of the Oregon Nurseryman's Association who had a history and experience in food processing. He thought that the Hazard Analysis and Critical Control Points (HACCP) approach used in food processing would be a useful method for improving plant quality. He shared his idea with other nurserymen, state department of agriculture officials, and APHIS staff. This group worked together to create a trip to Canada because Canada had already created a systems-approach for their nurseries. The group met with Canadian CFIA officials and Canadian nurseries to understand how the approach worked. This group continued to work together to get the official USNCP pilot started. The original group of Oregon and Washington nurseries who had gone to Canada became the first set of nurseries to participate in the USNCP.

There is a perception among some individuals that the US has an agreement with the Canadians to mandate the replacement of the end-point inspection system with the USNCP at some point in the next few years. APHIS officials have indicated that although there was discussion amongst NAPPO members (Mexico, the United States, and Canada) about creating the systems approach, there is no looming deadline for a mandatory implementation. An interview with a Canadian official confirms this perspective. While CFIA supports the systems approach of the USNCP and they have a similar program on which the USNCP was partially based, they have even fewer nurseries (five) participating on their side of the border than the United States does.

Perceptions of the purpose of the USNCP

The perceived purpose of the USNCP reflects the different perceptions of why it was created. Some perceive its purpose as complying with a Canadian requirement. Others see its purpose as creating cleaner nursery stock. Finally, another group views the purpose of the USNCP as a combination of these other two: “to provide a clean product to an importing country based on a systems approach instead of end point inspection.”

Those who perceive its creation as complying with a Canadian requirement indicate that the USDA would not have adopted the approach had the Canadians not mandated it. As they tell the story, the Canadians had to cut back on their inspection staff and did not have the capacity to continue checking imports from the US with the same intensity. The Canadians wanted the US to adopt an approach similar to what they had to save them money; thus the USNCP was created.

The ones who see the purpose as cleaner nursery stock see the USNCP and the systems-approach that it uses as “the wave of the future.” They point out that end-point inspection simply cannot catch all of the pests and diseases. They see the audit-based systems approach eventually replacing the end-point inspection.

Finally, the individuals who perceive the purpose of the USNCP as providing clean plants to other countries emphasize the importance of facilitating trade, but also focus on how ensuring plant health does that. They talk about USNCP as preventing the movement of dangerous pests and diseases across borders. The Canadian official interviewed reflects this perspective indicating that the USNCP is important for improved trade relations and phytosanitary plant health.

2. Pilot nurseries in Oregon and Washington participated in the USNCP because their managers view themselves as leaders in the nursery industry and they wanted to be involved in shaping a new system.

The managers of the pilot nurseries in Oregon and Washington actually feel a great deal of ownership of the USNCP. They feel like they helped to create it both by co-conceptualizing it with APHIS and then by engaging in a co-learning process with APHIS about what should be in the manual and the feasibility of some of the requirements. They feel like they helped to build the USNCP that exists today and that is one of the main reasons they wanted to be part of the pilot. They consider themselves to be industry leaders and therefore they wanted to lead the industry in this new endeavor. They like being on the cutting edge.

The participating nurseries in California and Georgia should be viewed as the second wave of participants. They came on board based on the perceived success of an affiliated nursery in Oregon. The Oregon site shared its manual and insights with the California and Georgia sites, but the new sites

still had to make modifications to the manual and each demonstrate their own competency in the standards in order to participate.

3. Lack of formal information about the USNCP Pilot has hindered participation of more nurseries.

Although there are no precise data on how many nurseries could have participated in the USNCP Pilot, general knowledge of the nursery industry as expressed by state/local department of agriculture officials and APHIS officials indicates that there are many nurseries that could have participated in the pilot but have not. The evaluation team asked individuals across all groups to tell us why they think that others did not participate. In addition, we spoke to one nursery that strongly considered participating but then did not.

Four themes emerged from these conversations: (1) the perceived costs are clearer than the perceived benefits, (2) there is a perceived lack of support for the program, (3) many nurseries are waiting to see what the results of the pilot are, and (4) there is a perception that not all the standards are compatible with the way some nurseries are, or can, do business. A couple of people indicated that some of the nurseries do not want the level of government scrutiny that the program would bring to their properties, but this was not a pervasive theme. Each of these themes is examined below.

Perceived Costs Are Clearer Than Perceived Benefits

Very little official information has been released about the pilot USNCP program. This means that the primary information “out there” about the pilot experiences is based on informal conversations between individuals and across sectors. Virtually every nursery faced start-up challenges. While these challenges are real, they have taken on a life of their own in the discussion of the USNCP. Nearly everyone knows “the legend” of how hard it is to produce the USNCP manual – that it will take them a lot of time, they’ll probably need to hire a consultant that will cost about \$3-5,000 out-of-pocket, and that they will have to learn government-speak to get it right.

On the other side, benefits like “for us it is a feather in your hat kind of thing” are less tangible. The pilot nurseries tend to say that they did not participate because it would save them money; they participated because the USNCP would be an extra stamp of approval that they offer a clean plant product. The physical stamp of approval, however, that many were expecting has not materialized. In addition, the participating nurseries had expected to be able to self-certify their shipments to Canada, but not all of them have realized this benefit and they are not clear about why they have not.

Thus, with no official information about how the pilot is progressing, the industry is left with informal conversations to fill the void. These conversations note vague benefits, but a frustrating start-up period and some unmet expectations.

Perceived Lack of Support for the Program

As one state official described it, APHIS “flopped this [USNCP] out there as a pilot.” The official was referring to the lack of direction that the pilot has been given since its inception. While the official thinks the program has the potential to be a good one, he/she feels like the program is stagnating because it has no “quarterback, team, vision, deadline” or “salesmanship.” In the words of the official, “USDA needs to get some backbone and lead it [USNCP].” This is strong statement, but it reflects the sense of frustration of pilot participants who are invested in the program and want to see it go further. This sentiment was echoed by an APHIS official as well, “we’ve been cautious in launching – we need to get out and promote our product” but the official indicated that they needed to feel the support of industry to do so.

There is uncertainty throughout the program participants about where the “pilot” is going because they have not seen it promoted anywhere, not by APHIS and not by the industry. In fact, while no one is hearing anything promoting the program, they are hearing from entities that do not support the program. There are rumors in the western states that the eastern states don’t support the program. At least one individual heard that National Plant Board Members were skeptical about the systems approach. At least one individual heard that not all state/local governments would allow the nurseries to self-certify their materials even if the USNCP said they could. Finally, there is a perception that many states are not ready to move from an inspection-based philosophy of service to an audit-based philosophy of service. One state regulator indicated that he observed this issue at a conference he/she had recently attended.

Wait and See

Those nurseries that got in on the pilot wanted to be on the cutting edge and involved in breaking new ground. Many other nurseries, however, prefer to engage in systems that are established, where the risks and benefits are known. As the discussion above about the environment of the pilot indicates, these waiting nurseries have not seen what they are looking for yet.

Compatibility of USNCP Standards with Existing Ways of Doing Business

The pilot nurseries indicate that they didn’t have to change much about how they do business to conform to the USNCP standards. Typically, they say that participation required them to write more things down and document the processes they had in place. There is a pervasive sentiment, however, that nurseries joining the program in the future would experience USNCP differently.

Virtually everyone we spoke with indicated that not every nursery is likely to be able to comply with USNCP. Some indicated that the size of the nursery could be an issue: “no way I think that a nursery that has just a few people can do it.” Others indicated that the capacity of the nurseries could present a barrier: “it is an intense program, not every nursery will be up to the task.” One state official in a nonparticipating state was careful to point out, however, that size and capacity do not go hand in hand. Some very small nurseries care very much about their plant quality and have the capacity to ensure it, while other larger nurseries have plenty of staff but lack the will to comply. One participating nursery echoed this sentiment, saying “it’s about attitude” – you have to want to be a better grower for the USNCP to really work.

The extent of the documentation and the lack of flexibility in the standards were the two areas mentioned by the one grower who thought about participating in the program but did not. He indicated that the kinds of documentation required were incompatible with his staffing structure. In addition, he felt that some of the standards did not make sense given the kinds of plant materials with which he was dealing. He didn't perceive an ability to negotiate the standards in any way, but in fact early pilot participants indicated that they did negotiate some of the standards. One APHIS official, however, indicated that the USNCP was intentionally designed "tough" and they have taken things out as they worked through the pilot with participating programs. He indicates that the USNCP "is a tool for industry" and there is no reason we can't change the program.

Thus, there is a perception that all parties have taken a "wait and see" approach to the pilot which is impeding its progress forward. While officials who could move the project forward are waiting for the response of the industry, the industry is waiting for more clarity from the officials about where the program is going before they commit. Based on the nurseries that have participated in the project so far, it is difficult to tell what challenges other nurseries will face in the future. Yet, participants on all sides appear to like the USNCP program for the potential that it has. We discuss this further in the next section.

4. There are significant costs of entry into the systems-based approach of the USNCP program.

The pilot nurseries indicated that although they did not have to make any major changes to their nursery facilities or processes, they did have to invest significant time and effort into documenting their processes in the systems manual required for participation in the USNCP. A number of them indicated that they hired someone to help them create their manual. At least one nursery attempted to create the manual on their own, but after investing significant time they hired a consultant to complete the process. The nursery staff member indicated that they simply could not organize the manual according to the "government-speak" requirements of APHIS. While most of the nurseries did not document their costs for the manual, one indicated that nurseries probably spent \$3-5,000 to hire the consultant. Even with the help of a consultant, the pilot nurseries typically reported that they spent 1-2 years developing their manuals.

Creating the traceback system in the nursery can be another challenge. One nursery indicated that they spent \$5,000 upgrading their computer system to accommodate the additional plant tracking requirements. While they feel it was a worthwhile investment, it is still an upfront cost that others may face. A number of the nurseries indicated that implementing a traceback system is a real challenge, especially if they cultivate plants through numerous stages of the life-cycle. They said it is difficult to find tracking materials that can stand up to all the watering and sunshine.

5. USNCP and programs like it may be excessively costly for smaller nurseries.

While the start-up costs listed above were inconvenient for the large pilot nurseries, they are likely to be prohibitive for the average-to-small nursery. In addition, nurseries that are not already state-of-the-art may need to invest substantially to train staff to the required standards, hire new staff or consultants to perform the required scouting and treatment functions, or make structural changes in their facilities to comply with the systems requirements mandated by the USNCP. Structural changes are likely to depend on the age of their facility, the types of drainage and water treatment systems in use, and the way that they irrigate their plants.

The Canadian official indicated that no official study of costs of the Canadian Nursery Certification Program (CNCP) has been conducted. The official indicated, however, that a likely reason that only five nurseries in Canada have participated in the program is because of the same kinds of challenges expressed in the United States.

6. The pilot nurseries identify time saved and the implementation of strategies that mitigate infestation risks as the primary benefits of the program.

It tended to be quite difficult for the participating nurseries to express how the USNCP had benefitted their programs so far. They typically indicated that they were already doing what the USNCP required so it didn't change their operation much. They did indicate, however, that USNCP had improved on some less visible aspects of operation that helped them to mitigate the risks of plant infestation by facilitating strategies that support prevention. These strategies include increasing communication across departments, increasing transparency of processes within the company, increasing training of staff and opening up channels of communication for information to flow from the bottom to the top, increasing reflection on the reasons they engage in certain protocols/procedures, and elevating the importance of some of the mundane tasks that managers may sometimes skip over when there are conflicting demands for their time.

The nurseries talked about the USNCP as creating a "cultural shift" in who was responsible for plant cleanliness in the nursery. Essentially, while this had always been a goal and focus of management, now everyone knew it was part of their job and they were encouraged to come forward about a pest or plant symptom that they did not recognize. In addition, some of the managers emphasized that the USNCP reminded them of the importance of not just tending to the paperwork in their offices, but also walking around their own grounds to observe what is going on. As one manager said, it "made me look."

A couple of the nurseries indicated that they think they have saved money on the application of chemicals. Although they did not specifically track the change in their expenses, these nurseries indicated that the processes of the USNCP – especially the regular scouting component – had helped them to target their chemical use. So, rather than spraying broad-spectrum chemicals on a routine schedule to catch anything and everything that might arise, they were better able to predict what specific plants would need specific chemical applications at specific times. Other nurseries indicated that the USNCP had not changed how they used chemicals.

Time saved in the shipping process was the one tangible benefit of USNCP that all the participating nurseries noted. They did experience this time saved, however, on two different levels. In theory, the USNCP allows participating nurseries to self-certify that their plant materials are pest and disease free and meet the standards for export to Canada. The PCIT system allows approved nurseries to enter data about the plants they plan to export, get an electronic approval, and print a phytosanitary certificate (phyto) with a USNCP watermark that they send with their shipment to Canada. The advantage of this method of obtaining a phyto is that the nursery does not have to schedule a state regulatory official to come to the nursery, inspect the plants, and sign off on the phyto. The nursery can load the plants when they want and ship the plants when they want, increasing their export flexibility. They can even add plants to the load at the last minute. As one participating nursery indicates, “time is where we save the money.”

Some of the participating nurseries have attained the full benefits and flexibility of this self-certifying phyto process. Others have realized only a partial benefit, but are puzzled about why they don’t have full access to the self-certification system. Those nurseries not experiencing the full benefit indicate that they electronically enter their information into the PCIT system, they are allowed to load their plants into the trucks, but the state regulatory official still must come to their nursery to sign the phyto. They indicate that the state regulatory official is not inspecting their plants, only signing the phyto. After speaking to numerous growers, state/local agricultural officials, and APHIS staff, it is not clear to the evaluation team if this is simply an implementation anomaly as the result of a misunderstanding about how the program is supposed to work or something more. Describing the general scenario to some regulatory officials indicated that the nursery may be trying to export a “mixed load” of plants – some of which are covered under USNCP and some of which require a separate inspection and sign off.

Finally, some nurseries spoke of the monetary savings resulting from not paying a fee for the phytos they are able to issue to themselves. Some nurseries indicated that this saving was insignificant as compared to their total costs of doing business, while other nurseries mentioned it as a welcome relief. The phyto fees, however, vary substantially across states. While all phytos have a federal fee component, states can charge an additional amount. The state officials to whom we spoke indicated a range of state fees from \$19 to \$50 per phyto.

The extent of the savings through self-certification to receive a phyto can vary substantially from state to state based on pre-export procedures and fees charged for phytos. Some states, such as Georgia, must conduct additional plant material testing that could take up to one week to complete in the traditional system, while other states simply require 1-2 days notice for scheduling an inspector. In addition, fees for issuing phytos vary by state. Thus, savings in the phyto process are dependent on the state from which the nursery is exporting and the frequency of exports. High-export nurseries in states with more time-intensive pre-export requirements will benefit more than low-export nurseries in states with short pre-export turn-around times.

7. Many stakeholders identified potential benefits of traceback and risk mitigation that underlie the systems-approach embedded in the USNCP. These benefits extend far beyond the individual nurseries participating in the program.

As one state department of agriculture official said, “there is a lot of interest, hope, and enthusiasm” about the USNCP. Many individuals view the audit-based, systems-approach of the USNCP as “the wave of the future.” While some emphasize the operational benefits an expanded USNCP could bring to state/local departments of agriculture, much of the emphasis of potential benefits is expressed through a more scientific lens focusing on traceback and risk mitigation. These potential benefits can only be realized through an expansion of the system. Potential beneficiaries include the state/local regulatory agencies, APHIS, Canada, and the US society as a whole. The breadth of the benefits and potential benefits expressed are illustrated in Figure 2, and are further discussed here.

Reputational Benefits. As indicated earlier in this report, the pilot nurseries all indicated that part of the incentive for joining the USNCP would be the added verification of USNCP that their plant materials were clean. They thought that certification as a USNCP nursery would bring with it some kind of symbol, stamp or logo they could affix to their plant materials, like USDA Prime Beef or ENERGY STAR, which would promote their plants as meeting a special standard. They have been disappointed that this type of branding has not materialized. In addition, most have felt powerless to do their own branding around USNCP because there is so little awareness of the program in the industry, in states where there are no participating nurseries, and in the Canadian market to which they export.

The pilot nurseries see this benefit as the one that is likely to entice other nurseries to participate in the program. In addition, they think that if state departments of agriculture better understood the USNCP that they might be willing to accept the USNCP as a symbol of sufficient plant cleanliness for inter-state trade rather than imposing myriad other requirements. They have hopes that the program could be expanded in this way.

Operational Benefits. At least one APHIS official indicated that state/local regulatory staff could benefit from the increased predictability of nursery visits provided by the USNCP. No state regulatory staff identified this benefit themselves, but perhaps this is because of the low level of USNCP participation and the fact that some are still traveling to the nurseries for export sign off.

Essentially, the concept here is that the USNCP requires regularly scheduled surveillance and systems audits. State/local agricultural officials visit the nurseries for these audits instead of visiting them each time they have a shipment of plants to export to Canada. Nurseries determine the volume and frequency of shipments, making workload requirements for state/local agricultural inspectors hard to predict. Audit frequencies, on the other hand, are determined by the USNCP requirements.

One interviewee also indicated that the audit process would allow state officials to spend less time at high volume nurseries. USNCP has the potential to cut down on the number of times state regulatory officials visit participating nurseries. If nurseries export more than five times per year, then the state

regulators will definitely experience a decrease in their trips to the nursery because the maximum scheduled audits per year under the USNCP are five.

Increased Traceback. The concept of traceback relates to the tracking of plant material throughout its life-cycle. Many nurseries do not cultivate their plants from seed or cuttings, but rather nurture plants through a particular part of their life and then sell them to other nurseries that continue the process. In talking to the pilot nurseries, many of them talk about purchasing “liners” from vendors to begin the growing process. The “liners” are essentially baby plants. There are two elements of the USNCP that are relevant to this process.

First, USNCP attempts to avert the spread of plant pests and disease by requiring participating nurseries to pay close attention to plant materials arriving on their property for the first time. Liners purchased from vendors would fall in this category. Many of the nurseries indicated that the USNCP had caused them to pay closer attention to the plant materials arriving on their property. The plant material and the material it is packaged in could be a source of contamination.

Next, the USNCP requires participating nurseries to label their plants in such a way that it is possible to tell where they came from. If a pest or disease is found on a particular plant, the nursery should be able to tell what other plants in their own nursery that plant had been in proximity to, and whether it had recently come from somewhere else.

While participating nurseries have implemented some kind of traceback system, none indicate that there has been a need to put it to the test yet. They see the potential benefit as saving them both time in figuring out where the plant has been and money in terms of plant destruction. Depending on what has infested a plant, it and surrounding plants within a particular distance may need to be destroyed. Knowing exactly where the plant was allows for a more targeted response.

These traceback benefits accrue similarly to state/local regulatory officials, APHIS staff, and Canadians. One APHIS official explained it this way (paraphrased). If an infested plant were identified in a shipment attempting to cross into Canada, I would get a phone call to deal with the issue. Without a standardized traceback system in place, trying to discern all the places that plant had been could take days or weeks. With the USNCP process, it would only take hours. I’d be able to call the nursery that shipped the plant, explain the issue, and they could consult their records to determine where the plant had been, what other plants it had been in contact with, and the location of those other plants now – are they still at the nursery or have they been shipped elsewhere? We could contain the problem quickly.

Risk Mitigation/Plant Protection. The traceback discussion alludes to the broader implications of clean vs. infested nursery plants. Nursery plants travel – from nursery to nursery, from nurseries to retail stores, from nurseries to landscapers, from nurseries to individual homeowners, from one state to another, from one country to another, etc. Pest infestations and disease outbreaks have the potential to cause enormous damage, can create enormous costs not only to nurseries, but as one state regulatory official put it “whole forests and ecosystems are at stake.”

The US General Accountability Office (GAO) has conducted at least three studies between 2002-2006 focusing on the issues of invasive pests and their impact on U.S. ecosystems. According to their 2002 report regarding invasive weed management, invasive species pose the following threats to U.S. agriculture, ecosystems, and the economy:

Invasive species are found on agricultural cropland and in natural and urban areas, and can be either terrestrial or aquatic. Invasive species represent all taxonomic groups— plants, animals, and microorganisms—and cause harm by multiplying rapidly, crowding out native species, damaging agricultural and industrial resources, and generally altering natural systems. For example, they can alter entire ecosystems by disrupting food chains, preying on critical native species such as pollinators, increasing the frequency of fires, or—as in the case of some plants—simply overshadowing and outcompeting native plants. As such, many scientists believe that invasive species are a significant threat to biodiversity and many endangered species in the United States. The cost to control invasive species and the cost of damages they inflict, or could inflict, on property or natural resources are estimated to total billions of dollars annually. Once they have arrived, invasive species are hard to eradicate (pp. 7-8).

While there are many different kinds of pests, diseases, and pathogens that infect or infest plants, some of them attack the host plant and some are simply carried by plants that look healthy but are vectors or carriers of the problem organism. Sudden Oak Death, a.k.a. SOD, *Phytophthora ramorum*, or *P. ramorum*, is the most well known of the organisms that travel on certain nursery plants without necessarily hurting them, but kills oak trees that provide the canopies of some ecosystems. A 2006 GAO report indicates that “*P. ramorum* has already killed tens of thousands of tanoaks, coast live oaks, and black oaks with a mortality rate as high as 85 percent in some areas of California” (p. 25). In addition, some nursery plants are carriers for pests that can affect the food supply, such as wheat.

The 2006 GAO report also indicates substantial costs to industries and homeowners as a result of *P. ramorum*. The report indicates that the timber industry could lose up to \$30 billion if *P. ramorum* were to spread to Eastern deciduous forests (p. 26). Homeowners may need to pay \$500 to \$5,000 for removal of each infected tree (p. 27). In addition, homeowners may experience a loss in property values because the affected trees usually create desirable property attributes.

The point is that pests and diseases that affect nursery plants create externalities beyond the nurseries where the infestations occur. As one state regulator says about end-point inspections, “the old system doesn’t work anymore.” Traditional inspections prior to export rely on visual methods to determine if there is a problem with the plant, but not all plant problems can be determined visually. Some plants are shipped in their dormant state and won’t reveal problems until they wake up while other organisms simply cannot be seen. In addition, end-point inspections are not performed every time a plant is moved from one location to another. The systems approach of the USNCP has the potential to find problems early in the life of the plant. As one grower noted, USNCP creates “risk mitigation against pest outbreaks.” Another grower says, “philosophically it [USNCP] is a better system than we have now and it should be the starting point for going forward.”

Some nurseries hoped that USNCP might become a requirement in the future to “weed out rogue nurseries.” They see nurseries that operate purely for profit without regard to plant health or the integrity of industry as damaging the reputation of the industry as a whole. They pointed to salmonella outbreaks in the spinach industry as an example – no one wanted to buy spinach from anywhere for awhile because the fear was too high. Nurseries see the possibility of something like that happening in their industry as well. In fact, GAO’s 2006 report indicates that the California Association of Nurseries and Garden Centers estimates that California nurseries lost sales of about \$25 million in the spring of 2004 when other states barred California nursery plants entry due to fear that *P. ramorum* would affect their industries and ecosystems. California nurseries suffered additional losses from infected plants that had to be destroyed.

More than one respondent pointed to concerns about insufficient inspection of plants coming in to the United States as a specific problem. A study from the US General Accountability Office (May 2006) echoes this concern. The issue is that inspection of imported plant materials was moved from APHIS to the Department of Homeland Security Border Protection and Control staff when DHS was formed. The GAO report indicated several vulnerabilities of the current DHS-BPC efforts including: (1) not examining all key pathways of entry including commercial aircraft, vessels, and truck cargo, (2) lack of a risk-based deployment system for personnel, (3) supporting fewer agricultural canine units, (4) lack of evaluation of their current inspection program, and (5) insufficient coordination between APHIS and DHS-BPC regarding key policy changes and urgent inspection alerts. Thus, it is more important than ever for nurseries to pay close attention to the starter plants they are bringing to their nurseries. This requirement of the USNCP may help keep invasive species from spreading.

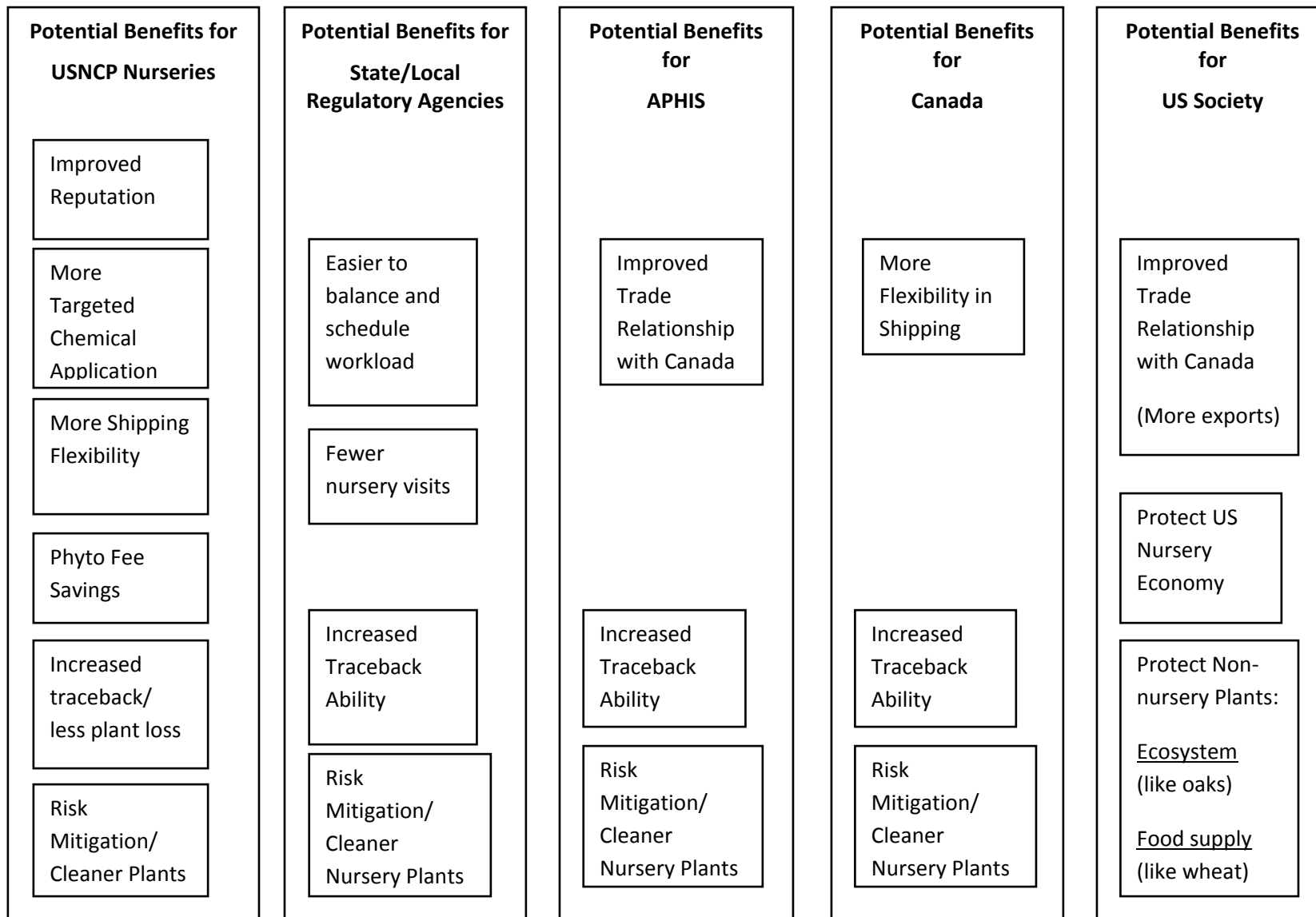
8. Operation of the USNCP audit-based certification program has been relying on open and candid collaboration and trust among the participating parties – the nurseries, the state departments of agriculture, and APHIS officials.

Beyond the participating nurseries, state regulatory officials and APHIS officials articulated a few other benefits of the USNCP so far. Both federal and state regulators indicated that USNCP had helped state and federal agriculture officials to form closer working relationships. APHIS staff noted that the program enabled them to get out in the field more, and many viewed that as increasing their job satisfaction.

All nursery managers indicated that they had good working relationships with APHIS staff and their state/local county department of agriculture staff. They indicated that the federal and state/local staff appeared to be well-coordinated in their USNCP efforts.

At the same time, the APHIS staff working most closely with the nurseries and the state department of agriculture staff, all seemed to be unclear about where the USNCP was heading. APHIS staff members did not express frustration about this, but indicated that most questions had to be referred to headquarters.

Figure 2: USNCP Benefits and Potential Benefits



9. Virtually all interviewees noted redundancy in the USNCP audits. From their perspective, the redundancy tended to weaken the audit process because nurseries could nearly memorize what was coming.

On the one hand these comments indicate that what pilot participants are seeing and doing in the field reflects what they are being taught in the APHIS training, on the other hand most of them did not see the redundancy in the audit process as productive. The audit training teaches the auditors to be looking for consistency in meeting the standards that the nursery operators have set for themselves. In other words, each time a particular type of audit is executed, it would be performed essentially the same way and should produce essentially the same results. The training did indicate that the auditors could vary what they were looking at, but the materials provided create a structure that encourages the auditors to perform the same kind of examination each time. While consistency is important, the pilot nurseries said the frequency of the audits made the steps too familiar and predictable. Thus, rather than assessing how well the nurseries were really maintaining their systems, the previous audits had conditioned them to know what to expect and how to answer the questions.

10. State departments of agriculture traditionally have had an inspection-based culture. Audit-based programs like the USNCP program require movement to a new culture.

Interviewees indicated that some states are likely to embrace the change, while others are likely to resist it. It will be necessary for APHIS to help states make the cultural shift. Just as benefits need to be made clearer to nurseries, they also need to be made clearer to state departments of agriculture.

This cultural shift also has implications for the audit training. The current audit training provided by APHIS does acknowledge this cultural shift and attempt to address how the performance of auditing is different than the performance of inspections, but this portion of the training could and should be strengthened significantly.

RECOMMENDATIONS

These ten findings lead to six recommendations as follows. As the recommendations indicate, progress on the USNCP will require the collaborative efforts of APHIS, the state/local departments of agriculture, and Industry. It is important to recognize the efforts of the pilot programs to improve the USNCP as they participated. Recognizing them as leaders in the field and tapping into their expertise to support the enrollment of more nurseries could engender good will and enhance the strength of the program.

1. Actions should be taken to clarify goals and objectives of the USNCP program.

Within each stakeholder group there is confusion about what the goals and objectives of the USNCP program are. This confusion appears to emanate from a communication void about the status of the pilot. Both APHIS and Industry have a role in clarifying the goals and objectives of USNCP by providing direction, leadership, and information. They must work together, however, to ensure that consistent messages are provided.

Messages need to be available in an accessible format, in language familiar to nursery operators, and available continuously and/or repeatedly. Pod-casts or You-Tube video clips of pilot nurseries explaining parts of the program may be helpful. Couching the program in terms of scenarios familiar to nursery operators is important. Continuous or repeated availability of information is important given the turnover rates in the industry.

The American Nursery and Landscape Association (ANLA) should sponsor training sessions at regional meetings and trade shows, facilitating both APHIS presentations and presentations from pilot nurseries to explain how the program works and what to expect from it.

APHIS should actively clarify the nature of the federal-state relationship of USNCP that may yield implementation differences from state-to-state by design. For example, in the audit training APHIS staff indicated that the states should take the lead in deciding additional elements that needed to be added to the audit to reflect particular pests of concern prevalent in the state or particular state concerns about each nursery. The audit training also indicated that states may refuse to allow the participation of nurseries where concerns have been documented in the past. Finally, states may require that the USNCP manual of nurseries in their state address issues that have not been identified on the national level. While the description of this expected relationship may mirror the typical APHIS-state relationship, questions and comments from state department of agriculture officials and nursery operators would indicate that neither group clearly understands these parameters of the USNCP.

2. APHIS should clarify the benefits of joining USNCP and market benefits to nursery growers, state departments of agriculture, Canada, and other countries. The marketing needs to be aggressive and strategic.

Carrots for participation are needed and the nursery operators value the reputations that USNCP certification could confer upon them. The lack of marketing of the USNCP is one of the greatest disappointments of nursery operators. They feel that more entities would embrace the program, it would operate more smoothly, and it would provide them with more rewards if the program was better known.

There was a hope among nursery operators that if states better understood the requirements of the USNCP that they would accept that certification in lieu of their own standards. In addition, some nursery operators indicated that the Canadian border brokers sometimes held up shipments with the electronic phyto because they were unfamiliar with the program, thus negating the primary incentive for participation.

3. APHIS and the state departments of agriculture need to recognize manual development isn't the only cost and that capital improvements may be needed.

The expense of manual development in both the time invested by the nursery operators and the money paid to consultants has become one of the primary barriers to participation in the program. While the pilot nurseries do believe the program and the manual have value, they all speak of the difficulty of putting the manual together and none of them understands the purpose of all the manual components, especially the requirements for the manual to be in "government language" and to contain government regulations.

It is clear that additional support needs to be provided for the manual development process. Many of the stakeholders suggested the creation of a manual template that would allow nurseries to select from lists of options for many of the items, rather than having to construct the manual from scratch. Although APHIS has indicated that there is a template, the comments provided by stakeholders would indicate that what currently exists is not sufficient.

In the template development, attention needs to be paid to the difference between the language of nursery operators and the language of government regulatory agencies. If the manual must be written in what the nurseries call "government speak," the template should include information that facilitates an understanding of both the reasons and meanings of the government language.

The template should become one of the vehicles for messaging the costs and benefits of the program. While the benefits of using a systems approach were evident to the pilot nurseries, it is not clear that the benefits will be evident to future nursery participants. The template should include information not only about the procedures the nursery must address, but why those procedures are important for a pest-free, quality nursery product.

The evaluation team heard from at least one interviewee that APHIS has contracted out for the creation of a manual template to help small to medium size nurseries enroll in the program. Based on what many interviewees expressed, this is an important start toward making the USNCP accessible to more nurseries.

Reducing the manual costs will certainly go a long way to reducing the barrier the manual is perceived to present. The manual, however, does not represent the only cost. Strategies should be developed to help nurseries deal with and document other start-up costs. ANLA could take a lead role in this area.

4. The Auditing function should be reassessed to make it more effective.

While the audits may be “doing their job” in the sense that no shipments have been stopped at the border for pest contamination, there are no data to support the efficacy of the audit process in yielding cleaner plants than the inspection process. In addition, a number of interviewees expressed concern about redundancies in and the paper-driven process of the audits. All of these issues could be addressed as the USNCP moves forward.

Audit Frequency: Assign frequency of audit based on risk rather than prescribed formulas.

Currently the frequency of audits is prescribed based on the USNCP status of the program. The number of surveillance audits is reduced as programs progress through the three USNCP stages – initial certification, conditional certification, and standard certification. Once standard certification is reached, the number of audits remains constant regardless of success. Regardless of stage, nurseries participate in a full, systems audit once per year. Based on information provided in the audit training it appears that audit teams can increase the frequency of audits based on perceived risks, but not decrease them. Reducing audits based on risks rewards nurseries for a job well done, encouraging them to pay attention, and reduces the redundancy which appears to breed a feeling of being too familiar with the process. In addition, it could allow state regulators and APHIS staff to devote more of their energies and attention to nurseries that pose a higher risk.

On-Site Audit Activities: Add more observation and process-based audit functions to the current, paper-focused process.

Some members of every stakeholder group expressed concern about the extent to which the on-site audits focused on documentation of compliance rather than observed compliance of USNCP standards. For example, nursery operators thought it would make more sense for auditors to ask their staff questions they should know from required trainings, rather than simply review documentation that staff had been trained. The nursery operators felt that the audits were simply a test of documentation ability rather than the real ability to execute the plans of the manual. They wanted the opportunity to demonstrate their compliance in their actions. State regulators also expressed concern that not enough plant material was being examined by auditors. Some of them would feel more comfortable with the transition from end point inspection to auditing if auditing involved the examination of plants. Finally, APHIS staff indicated that they had not intended USNCP audits to become strictly a paperwork exercise. One APHIS staff member suggested that traceback drills were a good audit mechanism for checking if the documented processes in the nursery actually function.

Cultural Shift from Inspections to Auditing: APHIS must facilitate a shift in state regulator thinking about the value of inspections vs. the value of audits.

At least three avenues are available for facilitating this cultural shift, (1) partnering with the National Plant Board (NPB) and its regional counterparts to create materials or facilitate workshops focusing on the scientific reasons for shifting from one system to another, (2) partnering with the National Association of State Departments of Agriculture (NASDA) to create materials and facilitate workshops on both the scientific and workforce benefits of an auditing approach vs. an inspections approach and explaining the state-federal partnership of the USNCP, and (3) better facilitating the cultural shift in the audit training and audit materials.

If APHIS is currently working with NPB and NASDA to facilitate this shift in culture, none of the interviewees noted it in their discussions with the evaluators. The audit training does currently recognize that auditing is different from inspection, and provides some insight on integrating the two functions when regulators visit the property, but it misses the opportunity to focus on how the auditing system could improve upon the end-point inspections system.

Audit Training: The audit training and materials for auditors should be modified to include information about risk-based auditing and expanding audits beyond paperwork review.

The audit training provides conflicting information about risk-based assessments. It implies that auditors can choose the frequency of their visits based on risk, but it means they can increase audits if they perceive more risk. The program should be modified to allow states the flexibility of decreasing audits based on risk and helping them to assess how they would do so.

The audit training also provides verbal instruction that indicates auditors can observe more than the documentation paperwork during their conduct of an audit. The written materials and checklist, however, emphasize only the auditing of paperwork. The audit training should provide auditors with more tools to facilitate the incorporation of the observation and process-based auditing, rather than tools that support only the auditing of documentation.

5. ANLA should play a strategic and supportive role in helping nurseries assess their viability for participation in the USNCP.

Create a support structure: Learn from existing government-industry partnerships that support industry quality assurance activities.

Voluntary certification and accreditation programs abound in many sectors. Some represent partnerships between government and industry, while others are developed, administered, and supported by their industries or professions without government support or sanction. Two examples of well-developed federal-industry partnerships are ServSafe (<http://www.servsafe.com/>) and ENERGY STAR (http://www.energystar.gov/index.cfm?c=news.nr_partners). ServSafe is operated by the National Restaurant Association, but collaborates with USDA and state regulatory agencies to promote food safety. ENERGY STAR is operated by the US Environmental Protection Agency and the US Department of Energy, but according to its website, partners with 17,000 public and private organizations. Both of these quality assurance programs provide substantial information to help the

public and interested participants understand the reasons to participate, the requirements of participation, provide support for participation, and provide information about the government-industry relationship.

Help nurseries assess if participation is a good fit.

The startup costs of participation are high and some nurseries may find it infeasible or impractical to participate. ANLA should develop and provide a checklist or self-evaluation to help nurseries determine if the benefits of participation outweigh the costs before they begin incurring participation costs.

Develop supports that will reduce barriers to entry.

In addition to manual development, technology to support traceability and staffing have been identified as the issues most likely to create barriers to entry for small-to-medium sized nurseries. ANLA should facilitate the development of software to support traceability. Whether nurseries participate in USNCP or not, it appears that traceability is an issue of increasing salience that they may all be asked to address in the future. Each pilot nursery indicated that they had to either modify or develop software to support the traceability requirements of the USNCP. While many of them had IT staff on board, they still found it to be a challenge.

ANLA should also help nurseries develop strategies to meet the staffing needs of the USNCP. ANLA could help nurseries create or provide information about how to create shared pools of professionals for those positions that do not require a continual on-site presence. APHIS has indicated that position sharing across nurseries would be acceptable to them.

Develop on-going training, support functions, and opportunities for industry learning.

Industry turnover will make it necessary for nurseries to have access to a continuous stream of training and support to appropriately develop their new staff members, especially when those staff members are running the nursery.

The USNCP also creates a learning opportunity for the nursery industry regarding the application of systems-based techniques. Perhaps the whole industry can learn efficient and effective techniques from each other if nurseries are provided incentives and opportunities to share what has worked for them in curbing or eradicating particular pests. Industry award or recognition programs may be one way to do this.

6. Consider a phased expansion of the USNCP pilot before opening it up for participation by any nursery.

Stakeholder responses make it clear that the existing USNCP pilot needs some work before it is expanded to include other nurseries (see previous recommendations). In addition, state departments of agriculture indicated that they need some time to evaluate their phyto fee structures associated with end point inspections to determine if fees for inspector time would simply be waived or would be

applied as part of the auditing process. Furthermore, lack of data collection during the pilot has impeded organizational learning about what is most effective and least effective. Finally, the seven pilot nurseries that have participated so far do not represent the “typical” nursery.

Improve upon the identified weaknesses of the USNCP before actively working on expansion. Set goals for accomplishing improvements and goals for expansion start date.

Provide clear information to the state departments of agriculture about how USNCP changes phyto issuance and the implications this has for fees charged.

Determine which data collected by nurseries and auditors would support organizational learning about the USNCP and develop systems to collect and analyze the data. Compare information collected to the science of plant pathology, not just the regulatory requirements.

Consult with the National Plant Board, the National Association of State Departments of Agriculture, the Horticultural Research Institute, scientists, and international partners to determine what data would be most useful in creating organizational learning about what the USNCP does and does not accomplish. Many stakeholders mentioned the lack of scientific data about the risks and costs associated with systems approaches, making decision-making about the program difficult.

Enroll new nurseries in the USNCP more strategically to test aspects of the program on nurseries that better represent “typical” nursery abilities and challenges.

Given the apparent lack of export data about nurseries, it may be that information for strategically selecting nurseries has not been available. The introduction of the electronic PCIT system, however, should ameliorate this problem.

Explore the possibility of creating a tiered certification program based on risk analysis. This may facilitate the participation of smaller nurseries or reduce costs in nurseries where there is less risk.

A number of stakeholders alluded to the lack of scientific information regarding pest risks. If data is available or becomes available through the USNCP, however, perhaps a tiered certification could be developed based on nursery risk level.

While the Canadian official was not asked to respond to this issue directly, the official did indicate that Canada may be amenable to program modifications based on the risks posed. Specifically, the Canadian official mentioned this in the context of indicating that perhaps a variety of the certification programs should be consolidated together to reduce the burden on both nurseries and inspectors.

CONSIDERATIONS FOR THE FUTURE

Turning the Program Over to the States

Some of the state department of agriculture staff to which the evaluation team spoke indicated that they assumed that eventually APHIS would “turn the program [USNCP] over to the states” to implement themselves. While a couple of states embraced this prospect, other states and some APHIS staff do not believe that all states have the capacity to implement the program themselves, particularly for a full systems audit.

Currently APHIS staff lead the audit process bringing both time and expertise. Full systems audits draw federal APHIS staff from beyond the state in which the nursery is located. This serves as a good training opportunity for APHIS staff to learn the auditing process, but also supplements that manpower available in the state for conducting the audits. The size of some nurseries requires more than one staff apply their efforts to the auditing process for more than one day.

While staffing is now tighter in state departments of agriculture because the nation-wide recession has resulted in staffing cuts and furloughs, the capacity of state departments of agriculture to manage this program on their own may not just be related to this economic crunch.

- 1. Discussions with state and local co-operators will be important in determining their future roles in implementing the USNCP program.**

Folding the US Greenhouse Certification Program under the USNCP

At the Audit Training, Mike Ward indicated that APHIS hoped to fold the US Greenhouse Certification Program under the USNCP program. According to data provided by APHIS, there are currently 151 nurseries in 10 states participating in the US Greenhouse Certification program. Florida has the highest participation by far with 129 participating programs.

The evaluation team had conversations with state department of agriculture officials about why nurseries would choose to participate in the Greenhouse Program rather than the USNCP. The perception is that the Greenhouse Program is much easier than the USNCP. While the USNCP requires an extensive manual against which the nurseries are audited, the Greenhouse Program has only a compliance agreement that serves as the basis for the audit process. The compliance agreement essentially provides a list of items that the participating program must agree to do, while the manual requires the participating programs to really think through and articulate their systems for handling the kinds of things that appear in the compliance agreement.

Both APHIS and State Department of Agriculture staff with whom the evaluation team spoke about a transition from the US Greenhouse Certification Program to the USNCP indicated that although they knew the nurseries would face challenges in making the transition, they thought the nurseries would make the effort to switch from one program to another. The nurseries have become used to the

flexibility of issuing their own phytos prior to export and they would not want to switch back to the end point inspection system that would require coordination with state department of agriculture staff. The conversation with the Canadian official indicates that Canada is amenable to the consolidation of the Greenhouse and Nursery Certification programs. In fact, the official indicated an interest in consolidating a number of certification programs including the nursery, greenhouse, fruit-tree, and grape-vine programs. On the Canadian end, the interest stems from the fact that industry establishments frequently participate in more than program. This creates duplicative audits which could be streamlined for both industry and inspectors if the programs were consolidated. The Canadian official noted, however, that any consolidation would have to take into account different risks posed by different plants, climates, and growing conditions (outdoor vs. indoor, etc.).

- 2. Transition from the compliance agreement to a manual will require the same kind of start-up time that any nursery entering the USNCP for the first time would need. It is important to consider these needs in structuring a transition period from one system to the other.**

Audit Training *(See Appendix C for more detailed observations and reflections on the Audit Training)*

We offer some considerations for the basic audit training offered by APHIS “to introduce PPQ Export Certification Specialists and Authorized Certification Officials to the audit process used in various agency accreditation programs” (audit training). These considerations are offered as a result of the participant-observation of one member of the evaluation team. The considerations emerge not only from participation in the training, but also from comparing the training observations to the information obtained through stakeholder interviews.

Experience of Trainer – it was clear at many times during the training that the participants needed a person in the room experienced with both auditing and the USNCP so that they could make the needed parallels to their jobs.

- 3. The trainer should have audit experience and should understand the audit program being used as an example. If the trainer isn’t going to have this kind of background, then subject matter experts need to be available.**

Audit vs. End Point Inspection – there was an effort to help individuals make this transition, but it isn’t clear that the effort was effective due to talking about fields other than agriculture, not talking about the science, and not using language directed at a particular audience.

- 4. Provide illustrative examples of how/why audit-based certification evolved in the field of agriculture, focus on the scientific need to move in this direction, and include impacts not only on the customer but on the externalities that affect society as a whole.**

Training Format – the format of the training was appropriate from an adult education perspective. It had a good mix of lecture, discussion, exercises, and role play. There will be a need in the future, however, to train many more individuals. This may require some kind of e-Learning adaptation.

- 5. Maintain the focus on appropriate adult education techniques, while exploring the e-Learning possibilities to ensure that more individuals can be trained each year.**

Paperwork vs. Direct Observation in Audit Process – the training does indicate that auditors can add on to the standardized checklists and can include observation of the property – not just documentation—in their audits, but given what the evaluation team heard in the field about the way the audit process is conducted there needs to be greater emphasis.

- 6. In both the training and the manual, emphasize that the audit is not just an exercise in paperwork. Emphasize that it is important to observe the processes and talk to staff. In the logistics section, ask people to think about planning ahead for this part, including the languages spoken by the staff. Include the Traceback Drill in both the manual and the training.**

(The Traceback Drill is a technique one APHIS official indicates that he likes to use as part of the audit process. This involves sampling some of the previous phytos issued by the nursery for shipments to Canada and pretending that a pathogen has been found on some of the plants. The nursery then traces the plants back through each step, demonstrating how the manual would work in a real situation, to find the original source of the problem.)

Interviewing Techniques – The section on interviewing techniques is very important because it helps establish the tone of the interactions. Overall, this is a good section but some changes are suggested.

- 7. Use some examples to explain what is meant by avoiding government-speak. Many stakeholders mentioned the problem of government-speak in the interview process. It isn't clear that government agents know when they are doing it. Consider updating the "Good Question" video to something more closely related to the auditing task at hand. Provide some information about cultural sensitivity.**

CONCLUSIONS

As a voluntary program, the USNCP has many potential benefits. While a number of interviewees expressed the hope that the USNCP would be converted to a mandatory process, none of these individuals were APHIS staff. The expression of interest in making the USNCP mandatory for all nurseries, regardless of export status, came from interviewees concerned about the integrity of the nursery industry and the growing risks posed by increased international trade. They see the livelihood of the nursery industry at stake and want to protect it from the disastrous consequences of major pest infestations. Their concerns about the long term reputation of the industry eclipse the short-term monetary losses of destroyed plants and lost sales.

APHIS staff, on the other hand, did not indicate an interest in creating a mandatory USNCP. In fact, they indicated that they did not ever see USNCP becoming a mandatory requirement, even for exported plant materials. They do, however, see the USNCP model for ensuring the cleanliness of plant materials as superior to the model currently provided by the US Greenhouse Certification Program. The only expansion of the USNCP mentioned by APHIS staff members was to fold the voluntary US Greenhouse Certification Program, which also deals with plant exports, under the US Nursery Certification Program.

The overwhelming response from interviewees is that while the start-up costs of entering the program are high, the benefits to the nursery industry and the larger environment are important and so immense as to be immeasurable. They see the possibility of making start-up costs lower and realizing what they perceived to be the individual nursery benefits of participation – self-issued phytos and market recognition of their clean plants.

The evaluators concur that the information available suggest a systems-based approach like the USNCP has the potential to prevent pest infestations that end-point inspections cannot. Based on the data available, it is clear that the USNCP could be improved to increase benefits to all stakeholders. The lack of data about this program or others like it, however, make it extremely difficult and challenging to say with any certainty that the USNCP represents the best approach to addressing the issues of concern. It does, however, appear to meet the approval of countries to which U.S. nursery products are exported and therefore serves as an important trade-facilitation mechanism, especially if it actually can increase the speed of the export process and if it does reduce the burden on the state department of agriculture inspectors.

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APPENDIX A: STATUTORY AUTHORITY FOR USNCP

According to the Accreditation/Certification Program Questionnaire completed for the US Nursery Certification Program and provided by APHIS staff member Robert Bailey, the following standards set the regulatory foundation for the USNCP Program. Links to each standard are provided below.

1. What is the statutory authority for the program? (Please provide the specific article or paragraph of the applicable Statute)
Plant Protection Act of 2000

ISPM 14 The use of integrated measures in a systems approach for pest risk management

NAPPO Standard ISPM 24 (sic RSPM 24) Integrated Pest Risk management measures for the importation of plant for planting

2. Which regulations support this program? (Please provide Title, Section, and Paragraph)
7CFR 353-354, 7CFR- 37, CFIA policy directives

Plant Protection Act of 2000

<http://www.aphis.usda.gov/brs/pdf/PlantProtAct2000.pdf>

ISPM 14

https://www.ippc.int/file_uploaded/1146658667005_ISPM14.pdf

NAPPO Standard RSPM 24

<http://www.nappo.org/Standards/NEW/RSPMNo.24-e.pdf>

7CFR 353-354

http://www.access.gpo.gov/nara/cfr/waisidx_03/7cfr353_03.html

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7CFR 319.37

<http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;sid=f7c7ccbf3cd7a896198eac2363a363d8;rgn=div5;view=text;node=7%3A5.1.1.1.6;idno=7;cc=ecfr>

CFIA policy directives

<http://www.inspection.gc.ca/english/toce.shtml>

APPENDIX B: PLANT PEST REGULATORY ORGANIZATIONS

National Plant Board (NPB)

<http://nationalplantboard.org/index.html>

Regional Plant Boards

Central: <http://nationalplantboard.org/region/central.html>

Eastern: <http://nationalplantboard.org/region/eastern.html>

Southern: <http://nationalplantboard.org/region/southern.html>

Western: <http://nationalplantboard.org/region/western.html>

National Association of State Departments of Agriculture (NASDA)

<http://www.nasda.org/cms/7192.aspx>

North American Plant Protection Organization (NAPPO)

http://www.nappo.org/menu_e.shtml

International Plant Protection Conventions (IPPC)

https://www.ippc.int/index.php?id=2&no_cache=1&L=0

APPENDIX C: APHIS AUDIT TRAINING OBSERVATIONS AND REFLECTIONS

Following are observations and reflections of the Audit Training. First we provide an observation or set of observations, and then in parentheses we provide some reflections about those observations. Finally, we provide a summary of key reflections and recommendations, indicating how these compare/contrast with what we have heard in the field. None of the Audit class participants are currently involved in the USNCP.

Purpose of the class: Introduce auditing concepts (not specific to any field or particular program). The official course purpose is: “The purpose of this training is to introduce PPQ Export Certification Specialists and Authorized Certification Officials to the audit process used in various agency accreditation programs.” (slide #5, introduction section)

The idea is that individuals would take this class before performing any audits, would then participate as a member of an audit team a few times, then take Lead Auditor Training, and then lead their own audits.

(In reality, Lead Auditor Training is currently in development so there are people leading audits who have not been to a Lead Auditor Training although they have likely been through the other steps.)

Intended Audience: The training was designed for APHIS PPQ Export Certification Specialists and Authorized Certification Officials. This August 2010 training was the first attended by State Dept of Agriculture staff members (per the trainer).

Trainers: Trainers come from USDA’s Professional Development Division. There is a section assigned to focus on Plant Protection and Quarantine. The trainer for this session was teaching it for the first time. Mike Ward, APHIS Accreditation Manager, and Laney Campbell, APHIS Eastern Regional Program Manager for Export Certification and Trade, were in attendance as “subject matter experts.” The trainer indicated, however, that subject matter experts are not always in attendance.

(As trainers may or may not have field experience in what they are teaching, lack of attendance by subject matter experts could be problematic. There were many instances during the August 2010 training where there would have been information void without the subject matter experts, especially questions about using the information from class in the field.)

Format: The training took place for two days, 8 hours per day, with a 1 hour lunch break each day. There were a few other breaks offered. No snacks or drinks were offered but there were places to purchase them and time to do so. The training techniques included lecture, discussion, individual and group exercises, and role play. Each participant was provided with a manual that included the PowerPoint, places for notes, and supplementary materials, as well as a pen and a stress-squeeze toy.

(From an adult education perspective, the format was appropriate. The trainer indicated that training the number of people needed has been a challenge. She indicated that last year they could only afford to train 10 people. Will need to think about how to train more people more efficiently. The trainer indicated that her department is learning how to incorporate more e-Learning opportunities. We can

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contact her later to get more information about what kind of training APHIS is capable of providing and her perspective on how this training might work in other formats.)

Participants: The participants were a mix of APHIS PPQ staff and state department of agriculture officials. Everyone was asked to indicate their level of audit experience. Most indicated that they thought they had virtually none. This was a lower level of experience than the trainer expected.

Content: The content was adapted from CFIA (Canada). It seems that it was taken verbatim throughout most of the training.

(This is a bit problematic. I'll discuss in relation to particular concepts.)

Course completion: There is currently no test involved to signify meeting the standards of an auditor. Course completion signifies meeting the standard.

(Even I received a certificate indicating that I had successfully completed the audit training. I see this as problematic given the generic nature of the course. If people successfully completing this course go out with other, more experienced individuals, it is probably OK but at a certain point this may no longer be possible depending on how fast the auditing programs expand.)

USDA audit-based systems: The course indicates that there are currently four USDA audit-based systems: USNCP, US Greenhouse Certification Program (USGCP), Customer Assisted Inspection Program (CAIP), and Seed Certification Program. States apparently also have some audit-based programs and some programs called “workplans” are also audit-based systems.

(This training is supposed to give you a basic understanding of how to do any audit in any system. In this session they used the USNCP to provide examples but most participants were unfamiliar with the USNCP. The manual provided information about the program but it didn't really provide much grounding for the information because participants were not familiar with either auditing, or USNCP.)

Quality Systems

Quality Systems – This is one of the key sections of the training. It focuses on the history/evolution of quality-based systems in industry although none of the examples are plant-based. *(Again, this makes it hard to attach information for the tasks at hand.)*

What is quality? – Product is consistently pest-free – “no junk”

Quality – meeting/exceeding the quality standards of the customers *(seems to only refer to direct customer, does not take into account externalities)*

Quality assurance – can be done through regulation – confidence that pest risk as been mitigated

Evolution of Quality Assurance

APPENDIX C: APHIS AUDIT TRAINING OBSERVATIONS AND REFLECTIONS

- Begins in 18th/19th century with the craftsman/apprentice approach where the master craftsman inspects each individual item crafted
- 1920-30's – an end point inspection was created because too much produced for a single person to look at every aspect
- 1950s-1970s – discovered weaknesses in end point inspection and stakes were often higher if there were mistakes – began to institute QA systems throughout production process
- “Today” – Whole systems approach to quality – everyone is responsible for ensuring quality (*we frequently heard the nursery growers say that this is what USNCP did for their nursery*)

(This is interesting, but no parallel to plants is given. Seems like it would be more effective to make the direct connection rather than to assume that everyone in the room is able to do that.)

How Standards Evolved

- Military specifications – went from soldiers need to have shoes to soldiers should have shoes that fit so we have to make standardized sized shoes; weaponry similar – global market created a need to have pieces fit together across countries to assemble needed weapons systems
- British Standards Institution – created first written standards; needed standards across countries to facilitate trade
 - This led to the current ISO standards, especially 9000 series and 14000 series
- American Society for Standards and Six Sigma (Japanese) also evolved
- Led to a Total Quality Management Approach
 - Quality Assurance
 - Writing things down: responsibilities, procedures, continually document – what occurred and how to fix it
 - Audit Verification
 - Look at paperwork – are you really doing what you said that you would? Have the processes been followed?

(This part is OK but again leaves it to the listener to make the connection to plants.)

From Inspection to Audit in PPQ

- Complex Systems
- Mature Identity
- Streamlined Federal workforce
- Limited resources allocated based on risk

(It would seem that it is the responsibility of this one slide to make the connection between the other systems and plant systems. Yet, there is no talk about the science behind why audit is better than end-point inspection. In fact, they make it sound like end-point inspection would be preferred if only there were enough staff to do it. IT SEEMS THAT THIS IS A KEY POINT LOST HERE. THEY FAIL TO MAKE THIS SCIENTIFIC POINT AT ANY PLACE IN THE TRAINING AND YET ISN'T THIS ONE OF THE MAIN POINTS OF THE

APPENDIX C: APHIS AUDIT TRAINING OBSERVATIONS AND REFLECTIONS

TRAINING? They clearly recognize the need to help people transition from Inspection to Audit but they miss one of the most important reasons as identified by the people we have interviewed.)

There are then SIX slides devoted to the ISO 9000 series quality standards. The trainer pretty much skipped over these and no one in the room seemed to mind. Not clear why so much emphasis on this would be needed.

Parts of Quality System

- Six slides are used to dissect this diagram and then an exercise in Pizza Making is used to reinforce the points

(I think this diagram and the parts of the quality system are effective but AGAIN no translation to plants is made. I guess Pizza Making is thought of as something familiar enough to everyone to make the point, but I can tell you that the group I was in seemed to lose the forest for the trees – tend to get too much into the weeds to remember the point. Also, focus seems to be on pleasing the customer rather than on safety/sanitary issues which would have the most relevance to the plants.)

Quality Management Principles (direct from slide on top of p. 10)

- Quality is everybody's business
- Do it right the first time, every time
- Co-operate
- Communicate

(These principles seem to be reflected in the grower's words regarding USNCP. This message appears to be coming through strongly but the way it is illustrated in the training doesn't seem so clear. A series of four diagrams is used to illustrate management structures that do and do not reflect quality principles but I didn't really get the point. Also it makes it look like you can only apply this to a place that has at least two levels of management.)

Next there are two slides that attempt to compare PPQ and Quality Assurance Systems of Clients.

- Discussion of who the clients are for PPQ
- Answer – industry: help to get materials out of the country – facilitate trade and maintain quality of plant materials
- Emphasis – Industry must meet a minimum standard but they could set a higher standard for themselves. Whatever standard they choose, they will be audited to that standard (as indicated in their USNCP manual).

(Again, the focus is on the direct customer without any discussion of externalities. Is solely about commerce, not about environmental safety. Could emphasize externalities here.)

Finally, there is an exercise to compare elements found in Inspection vs. Audit.

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(This is a really important exercise but seems to be placed in the wrong spot in the training. We haven't yet talked about Inspections vs. Audits in a detailed way at this point so people are just guessing. Most of what people guess isn't what the "answer" is and the trainer is generally at a loss to explain why. We begin to understand from the participant comments that there are programs in the states with the name "Inspection" that are actually "audit" systems – more confusion. Instructor tries to clarify by saying we are talking only about federal programs but now the whole exercise is really lost. Seems to indicate that training needs to be tailored for specific audiences or be clear when they are talking about Fed vs. State program OR it could be that elements in the audit vs. inspection chart should be gone over first, and then the quiz after.)

Emphasis to participants that they may have to wear two hats as once. You are still a regulator. If you are on a property and observe a violation of some other law, need to enforce it. Voluntary audit program does not exempt nursery from meeting regular standards.

(Questions at this point indicate that Instructors need to understand how things work in the field and to be able to answer questions about how class participants would operationalize this into their work environments. Without the subject matter experts in attendance, there would have been an information void.)

Audit Process

Audit Process – Terminology

(There was much mumbling in the room about the definitions being in Canadian bureau-speak)

Audit Process – Objectives of Auditing (Directly from slide on bottom of p. 4, Audit section)

1. The objective of an audit is to determine if the activities in a QA System conforms to what was planned in the QA Plan (manuals of procedures, work instructions, memos, quality manuals, etc.)
2. Feedback can be gathered to ensure that what is delivered is meeting the PPQ standard.

Reasons to Perform an Audit – *they all seem to be very inward looking for the benefit of that particular nursery (again externalities appear to be ignored)*

Types of Audits – External (directly from slide at top of p. 8, Audit section)

- Objectives of an external audit
 - Assess auditee's quality system against regulatory/program requirements
 - Verify that system is implemented as written
 - Observe system's effectiveness

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(All of these objectives would indicate that an audit is more than a paperwork exercise. Note that instructor indicates that the objective of an audit is to obtain a baseline and then compare to that over time – that would indicate that redundancy is required for an audit.)

The rest of the course is focused on the steps in performing the audit. There are a number of exercises, including role plays, to enforce these ideas.

(This part was fairly concrete, but here more than anywhere the insights of people who had been out in the field were the most needed.)

Talked about who is “our” customer

- The nurseries are the customers
- They decide the level of the quality (above the minimum standard).
- Quality assurance is about consistency
- Quality is the responsibility of everyone in the organization

Went over the two types of audits for USNCP: systems audit vs. surveillance audit

- A full systems audit uses all of the checklist items that appear in Addendum 3 of the USNCP manual

(Note: there appear to be a number of assumptions about what the training participants will understand about a nursery “system” and how the various parts fit together. While they do emphasize the difference between end point inspection as an enforcement “gotcha” mentality vs. audit which is a more supportive role, they don’t address the difference in how you might think about a “system” vs. end point inspection.)

There is emphasis on auditing to the standard that the grower has put forth in their manual. They can change the manual whenever they want but they have to send the change for pre-approval to APHIS before acting on the change.

A significant amount of time is spent on helping the trainees learn interviewing techniques, especially reflective listening. Emphasized:

- Generate open questions using: who , what, when, where, why and how
- When you want concrete answers use: do, did, are, is, can, will; these can be used to close a conversation and move on
- Speaking the language of the growers rather than government speak *(but they didn’t give any examples of government speak; I’m not sure government folks know when they are using government speak so a concrete example would be helpful here)*
- Speak to staff at all levels, not just department heads *(it has come up a few times that many of the staff below the management level don’t speak English so there needs to be some consideration given to this)*

APPENDIX C: APHIS AUDIT TRAINING OBSERVATIONS AND REFLECTIONS

- Para-phrase back when someone answers your question to be sure that you really understood what they were saying to you
- Don't jump to conclusions based on a single answer; should triangulate
- Pay attention to body language (but need to be culturally sensitive)
- Explore a little deeper than what the words on the page say – for example, the manual might specify checking a particular plant block on a weekly basis – need to know what “week” means – every 7 days, a calendar week, etc
- There should be an official note-taker but everyone on the audit team should take notes to capture the different perspectives.

(All of these tips/techniques seemed appropriate to the task except the “Good Question” video. The idea behind the video was fine but it focused on HR issues in a company. Perhaps could be made more relevant. One participant piped up about needing to consider culture. She indicated that there was information about this, especially in regard to working with native peoples, in the Ag Learning Times.)

APPENDIX D: DATA COLLECTION INSTRUMENTS AND PROTOCOLS

Questions e-mailed to Mike Ward, APHIS, June 29, 2010

3.1.1.1 of the US Nursery Certification Program Pilot Manual indicates that up to 4 nurseries per state could participate in the pilot. They were to be nominated “by the industry organization of the state”. The nursery must have shipped to Canada in previous year, is shipping to Canada during the year of application, and has plans to ship to Canada during the next two shipping years. If more than 4 nurseries per state are nominated, selection of participants will be done by random drawing.

- (1) What date did the pilot process begin?
- (2) How many nurseries were thought to be eligible to participate at the time the pilot was announced?
- (3) How many nurseries were nominated in the initial year of the pilot? Was this about what APHIS expected?
 - 3a. Which states nominated these nurseries?
 - 3b. Was it necessary to exclude any nominated nurseries through random drawing?
 - 3c. How many nominated nurseries made it through the application process to initial certification? If not all made it, please describe why some didn't make it.
 - 3d. How many of these initially certified nurseries made it to conditional certification? If not all made it, please describe why some didn't make it.
 - 3e. How many of these conditionally certified nurseries made it to standard status? If not all made it, please describe why some didn't make it.
 - 3f. Did any of the pilot nurseries have their certifications suspended? If yes, please describe what happened.
- (4) Based on the conversation with the evaluation team on June 28, it sounds like the certified nurseries in Washington, California, and Georgia entered the pilot after the initial year. Please provide the dates that these nurseries entered the pilot.
 - 4a. What stage of certification are each of these nurseries in (initial, conditional, or standard)?
 - 4b. Are any of these nurseries affiliated with the certified nurseries in Oregon? If yes, which ones and how?
 - 4c. Have any of these nurseries had their certification suspended?
- (5) Are there any nurseries that have applied for certification where the status is pending initial review and evaluation?
 - 5a. If yes, please indicate how many and in what states they are located.
 - 5b. If yes, are any of these nurseries affiliated with the seven currently certified nurseries?

3.6 of the US Nursery Certification Program Pilot Manual indicates that at a minimum, the following types and frequency of monitoring will be conducted by APHIS. *initial year of participation*: 4 surveillance audits and 1 systems audit; *conditional status*: 3 surveillance audits and 1 systems audit; *standard status*: 2 surveillance audits and 1 systems audit

- (1) Does the process outlined in the pilot manual dated July 24, 2008 represent the up-to-date audit frequency and process?
- (2) Is it a correct understanding of the audit system that both an APHIS official and a state or county government official conducts the required audits together?
- (3) Can the evaluation team review the audit reports?
 - 3a. If yes, where can we get the audit reports and how can we view them?
 - 3b. If no, can we get a summary of audit findings and types of corrective actions that have been issued?

APPENDIX D: DATA COLLECTION INSTRUMENTS AND PROTOCOLS

Questions e-mailed to Mike Ward, APHIS, September 1, 2010

Following are some data that we'd like to examine related to USNCP for 2009 or the most recent year available. You'll note that we have requested the data by state. This is because state level variations can make a difference in parts of our analysis. If the data are not available at the state level, please provide what you have. We'd prefer to have the data before the end of September, but if that isn't possible please give us a timeframe.

Nursery Data

of nurseries per state that export to Canada

Greenhouse Data

of greenhouses per state that participate in the Greenhouse Certification Program
(At the Audit training you mentioned that there is the intention of combining the USNCP and the Greenhouse Certification Program so understanding this population is also relevant.)

Phyto Data Overall

of phytos issued per state for export of nursery stock to Canada

phytos for nursery stock held at Canadian border

phytos for nursery stock rejected at Canadian border

Pre-Post Phyto Data for USNCP Pilot Nurseries

For 3 years before certification and then since certification

Export Inspection Systems by State

States that use centralized agents

States that use county-based agents

State inspection processes before issuing nursery stock phyto to Canada (for example in OR and WA it seems to just be a visual inspection but GA requires nematode testing at a lab)

APPENDIX D: DATA COLLECTION INSTRUMENTS AND PROTOCOLS

Semi-structured Interview Questions for Stakeholder Interviews

- (1) Confirm stakeholder name/affiliation.
- (2) How have you been involved with USNCP? How long have you been involved with USNCP?
- (3) Please discuss your original decision to obtain the USNCP phytosanitary certification (nurseries). Please discuss your state/local decision to participate in the USNCP (government).
 - a. Probe for benefits, costs, trade-offs
- (4) Please discuss your experience in becoming certified (nurseries). Please discuss your participation in the certification process (government).
 - a. Probe for experience vs. expectations, suggestions for improvement
 - b. Probe for benefits, challenges, and costs
- (5) Please discuss your experience with the USNCP after your nursery became certified (pilot nurseries). Please discuss your on-going experience with the USNCP (government).
 - a. Probe for on-going benefits, challenges, and costs
 - b. Probe for savings/new income
 - c. Probe for recommendations
- (6) How did the USNCP change the state/local department of agriculture's role? (government)
- (7) What kind of relationship do the state/local departments of agriculture staff have with APHIS? (government)
- (8) What advice would you have for APHIS in moving forward with the USNCP? (all stakeholders)
- (9) If the USNCP were expanded, what impact would that have on the state/local department of agriculture? (government)

We also requested that the nurseries show us parts of their USNCP manual, and some part of their nursery that represents something they have to do for USNCP.

APPENDIX D: DATA COLLECTION INSTRUMENTS AND PROTOCOLS

Nursery Site Description Form

(Each nursery interviewed was asked to complete this form prior to the interview or have it waiting for us when we got there. In some cases, however, the nursery filled out the form during the interview. We requested estimates of the information so as not to create extra burden on the nurseries.)

Nursery Name:

Nursery Location:

Date Nursery Founded:

Land Area: ___crops in the open (acres) ___crops under glass or other protection (square feet)

Nursery Personnel (on payroll in 2009): ___ **total employees paid in 2009**

 ___ hired employees paid in 2009

 ___ family employees paid in 2009

 ___ contractors paid in 2009

Typical number of employees on payroll at once (2009): ___

Total sales (2009): \$___

% of sales (2009) exported to Canada: ___%

% of sales (2009) sold in state: ___%

% of sales (2009) sold inter-state (inside U.S.): ___%

Calendar Year Received Phytosanitary Certification: ___

Was your original Certification Manager already on staff?

 Is your current Certification Manager your original CM?

 If no, how many CMs have you had since you started?

Was your original Pest Control Manager/Advisor already on staff?

 Is your current Pest Control Manager/Advisor your original PCM/A?

 If no, how many PCM/As have you had since you started?

Did you have to make any capital improvements to your nursery operation to comply with the phytosanitary certification requirements (like build new structures, move structures, buy new equipment, etc)?

APPENDIX D: DATA COLLECTION INSTRUMENTS AND PROTOCOLS

If yes, approximately how much money did you spend on these capital improvements? \$____