

## Technical Advisory Committee Response to

### Draft Questions for Technical Advisory Committee – Sept. 24, 2024 Priority

attention/ranked for importance: **Ranked A, B or C**

**Overarching Questions:** The following are the foundational questions the CPDPC believes will best inform the refresh of the program’s strategic plan and fuel operational efficiencies throughout the program. While some may be more operational in nature, we’re seeking input from the Technical Advisory Committee (TAC) to provide a science-based response to these questions.

1. How do we quickly and efficiently move the survey work away from urban areas and focus our resources on areas adjacent to commercial citrus?

*The group was not unified or in agreement that moving away from urban areas and focusing resources on areas adjacent to commercial citrus was going to benefit the longer term aims of disease control and management. There are concerns on the regulatory and biological impacts of this approach. However, to address the question at hand, the following steps are recommended:*

1. *Clarify the question. It refers to moving away from urban areas, but presumably it actually means refocusing efforts in urban areas so that the program focuses on locations closer to commercial citrus, not refocusing program resources away from urban citrus completely?*
2. *Assuming point 1 is an accurate interpretation, create a working group to identify which activities to stop/reduce, and*
3. *Evaluate the resources freed up by step 2. so that,*
4. *The working group can design appropriate survey programs close to commercial citrus, taking local risk factors into account in assigning effort, and,*
5. *Put in place the appropriate oversight/evaluation process to assess the performance of the new approach and report to CPDPC.*

2. What tasks should we move to the PCDs and how can we expedite the transfer process?

*The different Pest Control Districts (PCDs) across the state have a range of resources available to conduct activities related to the current CPDPD program which makes it difficult to identify specific tasks to move. Any activities moved to PCDs should be introduced using a purposeful designed approach that clearly defines the specific goals intended by moving activities to the PCD. Within the current regional task forces, several groups are involved in coordinating activities to address regional needs and based on the area, there may be other organizations that should be considered if the CPDPC wants to move activities to a regional level. For example, County Ag Commissioners have a number*

*of responsibilities already – if the goal is for more regional control, they might also be considered given their regulatory responsibilities and authority.*

*Members of the group also felt that this was an “operational” question. This question needs to be addressed by CDFA’s Pest Control Districts and Task Force Committee, which has held meetings in the past and may have a better understanding of the “activities where PCD/Task Forces align/assist”. Additionally, it’s suggested that if the CPDPC is serious about deploying this strategy, a “test case” in which before and after costs and impacts of activities should be done to understand the impacts of moving CDFA activities to other groups (e.g. PCDs).*

3. Evaluate the program in each region (north/south, urban-rural) and determine the best program for each region, knowing they can be quite different?

*The regional management plans proposed by the TAC give a good starting point for discussion of this question. Please see Addendum A for more details.*

#### **Southern California Residential Program Ranking A**

4. Would reducing residential surveys for and tree removal of HLB-positive trees in primarily urban areas (i.e., Southern California) put commercial citrus regions at a higher risk?
  - See 2022 SAP perspective on page 25.

*While the group was not unanimous in this assessment, all members of the panel advocated for maintaining some level of current activity in the “core area” as a foundation for the program, which still includes tree removals and biocontrol in those areas. Reducing surveys and tree removals in any region increases risk to commercial citrus. Management of a growing reservoir of a plant pathogen requires testing and removal of infected hosts.*

*While focusing resources on areas closer to commercial citrus may reduce local risk to those groves, pulling resources away from the known epicenter of CLas+ poses longer term risk to the entire industry as the reservoir will grow unchecked and unmonitored. Two strategic suggestions coming from the panel would be (a) move resources to the edge of the “core area” in a modified containment strategy where tree removals would have the maximal impact and (b) increase testing closer to commercial citrus to pinpoint areas in which CLas+ has a higher risk of entering groves due to proximity.*

5. Multi-pest survey methodology adjustments (including an increased focus around commercial adjacent areas) and reductions in delimitation areas were implemented in early 2024. Have we recognized efficiencies (reduced staff hours, reduction in HLB detections, reduced budget expenditures on these activities?) in those changes?

*The group was unanimous in finding that a complete response to this question requires budgetary information at the CDFA level and further analysis beyond the scope of advisory opinion requested from the TAC during this initial response. If this item is of interest for the TAC to pursue, a working group can be collected to address with appropriate CDFA support to be provided.*

6. How should the program define an HLB hot spot now and in the future? How could we use these criteria to prioritize operational activities to be more efficient? What criteria would define when a hot spot is so out of control that current response protocols (treatment, tree removal, etc.) are no longer effective?

*The group was in agreement that the CPDPP needs to carefully consider how it defines a hot spot since it has far-reaching implications for strategic decisions moving forward. Hot spots should be defined by (a) positivity rate (%) of CLas+ plants tested and (b) at a smaller scale than counties or ZIP codes, such as STRs. While the group has not had time to develop a specific metric, there is interest in pursuing this further to come up with a recommendation that can change over time based on the extent of the CLas reservoir, testing capacity, and areas of focus, but is still scientifically objective. The final definition should be supported by a concerted statistical modeling effort, have both an infection density basis, and a temporal component to characterize whether control appears to be working, and take into account that a hot spot is an area the CPDPP may want to deemphasize.*

7. How do the HLB response treatments (250-meter foliar and systemic insecticides) impact the Tamarixia released in those areas? Is the timing of releases currently optimized, or do we need to re-evaluate the deployment of Tamarixia to be more efficient?

*The group was in agreement that better coordination is needed to ensure that releases are not overlapping spatially or temporally with treatments, which could improve the complementary nature of these two elements of ACP management. ACP population densities in HLB treatment zones appear to be extremely low due to a combination of insecticide applications and Tamarixia releases in the surrounding area. Preliminary analysis suggests the impact of biocontrol in these treatment zones is being underestimated due to some combination of a lack of suitable ACP stages for parasitoids or direct non-target effects of insecticides on parasitoids. Better coordination is needed to ensure that releases are not overlapping spatially or temporally with treatments, which could improve the complementary nature of these two elements of ACP management. Further consideration of this issue is also warranted for treatments surrounding new ACP detections, especially in areas where parasitoid establishment has not been yet confirmed.*

8. Given the latency of the disease expression, is there scientific justification that the multi-pest survey and HLB-positive tree removal contribute positively to eradication efforts?

*The group had a range of opinions on this question. There is no direct argument from the biology of the disease (as we currently understand it) to the proposition that testing for the presence of CLAs and removal of detected trees does not contribute to eradication efforts. In California it now seems clear that conditions are not continuously favorable for ACP or CLAs except in a few areas, such as coastal San Diego County. The long latency period for the disease may be even longer under California conditions, and this may serve to increase the possibility of disease management by preventing trees from acting as sources of inoculum while the possibility of detection exists. However, experiences in Texas would suggest that tree removal alone isn't enough to slow disease spread in commercial settings.*

*It's important to differentiate two periods in addressing this question. The latency period is the interval between when a tree is first infected with CLAs and when it becomes a source of new CLAs cells that can be acquired by ACP when they feed. The incubation period is the time between when a tree becomes infected and when symptoms appear (or when HLB can reliably be detected as infected by other means). Historically, in climates which are very suitable for both ACP and CLAs, a major problem with controlling HLB is that the incubation period is much longer than the latency period, so trees become sources of inoculum before they are visibly diseased, leading to the problem of "the invisible epidemic". The fact that the latency period is highly variable and can extend to over a year or more, also adds to the problem since it makes it difficult to quantify the risk of spread from data on known positive trees. The importance of strong psyllid control must be a part of the activities undertaken if tree removal is to contribute positively to eradication efforts. This result has been consistently shown in a range of field studies and in modeling work with independent and different modeling approaches. Further analysis of this issue is required to provide a more definitive answer as to the relative contribution of infected tree removal and ACP control on the rate of disease spread; additional support for a research project to address this question under California conditions is recommended for this industry to move forward.*

#### **Commercial Citrus Survey Ranking A**

9. To supplement the current multi-pest survey and commodity survey and increase the sampling of commercial citrus for HLB, what commercial grove survey approach would the TAC recommend to assess more commercial groves each year as efficiently as possible (i.e., start with pool sampling borders of commercial blocks, etc.)?
  - See 2022 SAP Report page 17, 18, 23 for initial recommendations on invoking a commercial survey in SoCal.

*The group was in agreement on this issue. The TAC recognizes why the CPDPC would like this question to be addressed, but the technical aspects of the question should not be examined in isolation from the regulatory issues and commercial interests of growers and/or the industry. Broadly, the aim of commercial screening could be tiered so that it maximizes the chances of detection. It should include the following elements:*

- *A properly designed survey plan*
- *The use of randomization in selection of trees so that it does not rely on symptoms*
- *Composite (aka group or cluster) sampling to increase the number of trees initially screened*
- *Initial use of tests that maximize sensitivity to minimize false negatives, followed up by repeat testing of any positives with a test that maximizes specificity to screen out false positives.*

*Members of the group see this as a priority to address, if the interest of the program is to pivot away from residential areas to commercial areas. In that case this would be a key program to develop. Testing ACP for CLas was also highlighted as a key surveillance method and a primary target for initial grove management efforts.*

### **Refusal Rates Ranking B**

10. In the existing residential and commercial grove surveying efforts – multi-pest and commodity – are refusals to cooperate (residential and commercial) with these voluntary activities at high enough rates where they could be skewing the program’s ability to get a complete picture of infection rates in California?

*The group was in agreement. The levels of refusals for commodity surveys and delimitation surveys were shared with the group by CDFA staff. Refusal rates were not provided by CDFA for the multi-pest survey, because nearby properties are surveyed should the initial location refuse. The group did express concerns about the rate of refusal in the Commodity survey. Specifically, the high refusal rates in the Ventura areas were noted as this region appears to be an outlier compared with other regions and may be skewing the program’s ability to get a complete picture of infection rates. Some TAC members recommended that the CPDPC representative for the Ventura region works with the local Task Force on outreach about this issue to determine its cause and improve participation rates. This acknowledgement of possible reduction in effectiveness is not to say that treatment efforts should be stopped in regions with higher than normal refusal rates as multiple partially effective actions may still help overall program goals.*

11. When conducting non-mandatory residential treatments (ex. ACP+ response, ACP detection in non-infested areas, etc.), are current rates of refusals making these treatment activities effectively obsolete?

*The group was in agreement. Refusal rates are not a systematic problem for the program and the CPDPC should be aware that concerns about refusal rate are currently*

*unwarranted. Rates of refusals were reported to the TAC and with only one exception were the refusal rates seen as an issue for treatments. For delimitation refusal, rates were very low across all counties reported and for commodity survey, refusals were low in all counties but one. Some TAC members suggested a possible approach to address this issue in future is the creation of a reserve earmark within the outreach budget which can be used for targeted outreach in areas where refusal rates are observed to be increasing, or when they exceed a pre-determined threshold.*

### **Surveying Non-Commercial Citrus Regions Ranking B**

12. In areas where commercial citrus doesn't exist, what is the impact of reducing program activities? *NOTE: build off existing work from Neil McRoberts and Sandra. Meeting notes, NMR, SO Looked at withdrawal of winter trapping in northern areas of the state.*

*The group was in agreement. Together with staff from CDFA, members of the TAC recently completed an analysis for CPDPC in which identified cost savings in the winter ACP trapping program in northern counties. The approach used for that analysis could be extended to examine objective risk for reducing other program activities in counties with little-to-no commercial citrus. Such analyses should, however, be conducted within an overall framework where the requirements to maintain the emergency status of the program overall, and for qualifying for federal program support, have been laid out.*

### **Commercial HLB Response Ranking A**

13. What is the most scientifically effective response to a commercial HLB detection that places a reduced burden or less punitive response on growers in the area?

*See responses below.*

- a) Is there a scientific rationale for a 5-mile quarantine? Could it be reduced and maintain efficacy?

*The group was in agreement. No clear scientific rationale for a five-mile quarantine was identified by the group but as this quarantine radius was identified by the federal and state regulatory agencies, those groups should be requested to provide the rationale used in setting the scale of the quarantine. Five miles is beyond the value that empirical studies have estimated to be the natural dispersal range for ACP, and what has been inferred from spatial analysis of ACP in residential trapping data. An analysis of commercial groves showed a significant invasion kernel of ~4-5 km from other infected groves. Regulatory agencies may use different parameters in setting up the quarantine distance. In these quarantine zones, the initial find may not be the initial site of infection so further survey should be conducted to find the full scope of infection. Efficacy of any quarantine zone depends on the range of activities that are mandated to take place within that quarantine zone to manage the pest/disease. The group believes that the 5 mile quarantine may be*

*larger than necessary but more information/studies need to be conducted to identify a minimum efficacious quarantine area.*

- b) What criteria should be considered when establishing a quarantine around commercial HLB detections? Are there specific circumstances that should be evaluated prior to the establishment of the quarantine (ACP population levels, terrain, non-contiguous hosts, etc.)?

*The group would need to understand the initial justification for the quarantine size by the federal and state regulators to best address this question.*

- c) What is the most effective and efficient treatment for safeguarding bulk fruit for movement?
  - 1. Consider treatment activities such as pre-harvest treatments, spray and move in certain regions, tarping, post-harvest treatments, etc.)? Should treatment activities change within different ACP quarantine zones?

*The group is in agreement. Tarping has shown effectiveness in reducing the movement of ACP with uncleaned fruit but the number of finds in packinghouses suggest some of the more lenient practices (i.e., grate cleaning) may not provide enough effectiveness, if not done in strict compliance with best practices; while grate cleaning can work effectively, the margin for falling below standards needed for compliance is narrow. Bulk fruit movement safeguards should continue to be part of any regional-specific management plans. The industry should consider minimizing long distance fruit movement when possible.*

#### **Fresh Slate Approach Ranking A**

- 14. Looking at the program and where we are today, is there anything California's program should have done differently (or now moving forward to change course) to be more effective or efficient in its fight against ACP/HLB?

*The group is in agreement. Relative to other programs and efforts to manage ACP and HLB across the US and across the world, the program has been responsive to changes in circumstance and has adapted as new issues develop. Phytosanitary programs develop and evolve as new information is learned and the CPDPP to date has been very responsive as new information comes to light.*

- 15. If the TAC could redesign the program from the bottom up, how would the TAC approach the new program?



*The group had a range of thoughts on this topic. A greater emphasis on regional management would be encouraged keeping in mind that humans can vector this bacterium along with ACP, and statewide coordination needs to be maintained as long as there is movement of plants, fruit and people across the state. Regional plans are suggested in the attached document (Appendix A).*

*Additional thoughts from the group, bear in mind the following:*

- There is no evidence of significant additional approaches or methods to combat the disease being used elsewhere that could be adopted in California*
- The California program has a history of adaptability, evidence-based decision making, and engagement with scientific expertise*
- The California industry has extensive oversight of program operations and has conducted periodic reviews of program performance*

*With those points in mind, the only clean sheet approach that wouldn't end up with something similar to the plans already being discussed, appears to be to start with the question of whether regulatory response in California needs to be significantly amended. The group noted that the broad thrust of the questions posed in this document highlights the inherent tension between individual grower/business interests and the regulatory requirements under which the program operates. Between the current situation and complete deregulation, significant voluntary efforts to detect and eradicate HLB cases in commercial citrus are only likely if a regulatory approach which is less burdensome to growers can be implemented.*

16. Are there any fundamental principles or effective tactics being explored elsewhere in the world that we should evaluate for use in California?

*The group did not identify any fundamental principles or effective tactics being explored elsewhere that should be evaluated. There were suggestions to avoid some areas of research, such as nutritionals as a sole mitigation treatment, but working to improve psyllid control and a focus on regional needs were the two areas that were recommended for continued support and evaluation.*

17. Climate As An Ally in the ACP/HLB Fight - What data would need to be collected to effectively analyze how California's climate influences the ACP/HLB fight in California and how the program might be adapted to take advantage of that influence?

*There is already a significant body of analysis in this area. The idea that California benefits from a less favorable climate for ACP (and CLAs) than Florida is well established. The TAC recommends that the group could carry out a short review/synthesis of the available information and report to the CPDPC. At various times scientific input to the CPDPC has emphasized the value in amplifying the natural benefits California provides rather than*



*viewing them as opportunities to cut corners. For example, the natural topography helped in establishing production regions which are isolated from one another by natural barriers to spread of ACP. The industry amplifies this effect by maintaining tarping requirements for bulk citrus movement. The same principle should be applied to the use of the climatic restrictions on ACP and CLas. This is the underlying idea in the regional management plans we have proposed and which have been provided along with this document.*

### **Longer-Term Questions** **Ranking C**

1. Removal of ACP Quarantine Areas – From an entomological perspective, how long would an area previously under ACP quarantine need to be ACP-free to warrant removal of the quarantine?

*This question should be part of a wider discussion about evidence-based quarantine exit criteria with regulators. When no psyllid is detected within the period covering two generations, the quarantine removal should be considered. An example that was shared with the TAC was that ACP adult survivorship varies with temperature and time of the year, so one has to consider the longest survivorship in the computation. The longest an adult psyllid lives is 88-90 days when temperature is between 55 and 60 F. Thus after 180 days with no detection, removal of the quarantine was suggested.*

2. Texas Tree Removal Program – Looking at Texas' departure from its residential and commercial tree removal program, what learnings can the California program obtain? What worked and what didn't?

*The lesson from Texas is that aggressive tree removal needs to be coupled with aggressive psyllid management for the greatest impact. All infected trees present in an environment cannot be identified for removal due to the latency period before symptoms develop, but an infected tree is not a problem in itself if there is no vector in the environment. The number of commercial finds near residential areas also suggests coordinating management between residential and commercial production areas will significantly benefit commercial production areas.*

Appendix: Links expire Nov. 3

- **CPDPP Activities Overview (includes overview of multi-pest, commodity and other survey activities):**  
[https://nstr.sharepoint.com/:p:/g/CC/EZvJQtJDC3RAifOC5wMmfgoBh1P2mlxEBdm8j\\_0mlypAWw?e=H5crvm](https://nstr.sharepoint.com/:p:/g/CC/EZvJQtJDC3RAifOC5wMmfgoBh1P2mlxEBdm8j_0mlypAWw?e=H5crvm)
- **2022 SAP Report:** [2022 SAP Review Full Report.pdf](#)
  - **2024 SAP Status Report:** [Success Acceleration Status SAP 2024.docx](#)
  - **Appendices:** [SAP Appendices .pdf](#)
- **2018 CPDPP Strategic Plan:**  
<https://www.cdfa.ca.gov/citrus/docs/committee/ActionPlan.pdf>
- **Active Citrus Quarantine Maps:**  
<https://cdfa.maps.arcgis.com/apps/webappviewer/index.html?id=a1c46000bf474fdbad97834b82e2cce8>
- **CPDPD Mission And Vision Statements:** [Mission and Vision.docx](#)

The Technical Advisory Committee that reviewed and responded to these questions includes: Bodil Cass, Robert Clark, Matthew Daugherty, Subhas Hajeri, Neil McRoberts, Ivan Milosavljević, Sandra Olkowski, Mamoudou Sétamou, and Melinda Klein (chair).

This report was submitted to CPDPD on November 5, 2024.

## **Addendum A. Commercial Citrus Regional Management**

### *General concept*

The idea is to use a set of basic disease management principles in a modular way to build a plan for each region. The emphasis given to different activities will vary from region to region, dictated by the baseline level of risk for that region and the seasonal fluctuation in risk (based on climate and local urban citrus density). For each region, a brief description is provided explaining the rationale for the priority actions identified and a statement about the key needs for that region in building its Asian citrus psyllid (ACP) and Huanglongbing (HLB) management plan. A table at the end of the document summarizes recommended activities by region. *Please keep in mind the ideas below are some of the thoughts from the TAC on those potential activities that will benefit the various regions. If this approach is taken, we encourage further discussion, engaging key parties from each region in order to fully develop regional management plans.*

The question of how to encourage more surveillance in commercial citrus by the industry is not addressed directly, but needs to be discussed, particularly in relation to regions such as Riverside, San Bernardino, Ventura and San Diego where there is significant threat of movement of CLas+ ACP from urban locations to commercial citrus. The San Joaquin and Sacramento Valleys are currently at a distinct advantage due to the lack of ACP and should build on that advantage to protect commercial citrus production. The current regulatory response to HLB detections in commercial citrus appears to be acting as an incentive for growers not to carry out scouting and testing of trees for CLas. A review of the overall program would benefit from an open discussion about the possibilities for a different regulatory approach that takes advantage of climactic, environmental and geographic differences between the regions to optimize control efforts.

If regional control efforts are developed, the inclusion of committee representatives from CPDPC including Grower Liaisons, Pest Control Districts, County Ag Commissioners office and key PCAs in the region should be considered. Key regional activities would be tailored to the needs and environmental conditions present in those regions with most activities focused around psyllid management, state survey and outreach efforts directed to assist regional needs.

### **Coastal San Diego**

The climate is among the most favorable for ACP development year-round in the state. Known HLB centers of infection and quarantine areas are in place. Heterogeneous commercial citrus production with a high proportion of ranchette properties that either do not participate in commercial citrus production or pick themselves and sell locally. A pest control district (PCD) covers some of the larger commercial production acreage, but not all, and does not maintain field or office staff. The terrain can be challenging for pest management activities including ground rig insecticide application. Urban citrus is common in larger towns and cities but much of the commercial citrus has some physical

separation from urban centers. Detachment from agriculture in some areas of San Diego and other cities may lead to relatively high refusal rates for urban programs. Increasing commodity survey refusal rates over the past few years in this area suggest commercial programs have similar issues in monitoring efforts. Based on the prevalence of ranchette properties, increasing efforts to improve psyllid control (e.g. additional releases of *Tamarixia radiata* in residential areas near small commercial producers) should be considered. Incentivizing alternate crops may also be an approach for this region to consider.

**Key needs in building regional approach:** There's a range of engagement levels between growers in this area that limit area wide control efforts that has been present throughout the ACP program activities. A review of commercial producer concerns and better communication may be needed for this region.

### **Coachella and Imperial**

The climate in this region is the least favorable for ACP development relative to any other region in the state. Commercial citrus is mostly focused in well-organized and active PCDs with good management and some existing organizational resources. Some growers in this region have additional regulatory burden from Sweet Orange Scab quarantines to deal with. Larger cities and private rural properties have backyard citrus, but refusal rates for urban programs are lower than in other areas impacted by ACP populations.

**Key needs in building regional approach:** additional resources and institutional structure to manage issues locally, regional data tracking for ACP to support decision making since ACP levels are so low.

### **Riverside and San Bernardino**

This region has some of the largest areas of commercial citrus at risk from HLB because of the proximity of known urban HLB tree finds, and the overall size of the urban citrus population. The more inland portions of the region will experience short periods of unfavorable conditions for ACP, but the level of climatic assistance in reducing ACP populations generally is low. Grower engagement in the ACP/HLB management program is variable. There are large variations in socio-economic status and connections with agriculture across the region leading to patchy refusal rates in urban programs. The region contains citrus packing facilities.

**Key needs in building regional approach:** prioritize defense of commercial citrus, additional resources and institutional structure to manage issue locally.

### **Ventura and Southern Santa Barbara**

ACP populations in this region show strong seasonal patterns, in step with available degree days, but modulated by the availability of citrus flush. Cool winters generally delay ACP development and result in relatively low infestation of the spring flush. Acreage is dominated by lemon which flushes more frequently than other varieties, such as mandarin and sweet orange, which have more defined spring/fall flush cycles. Relatively cool summer temperatures also lead to regional increases in ACP population numbers through the summer and fall months with numbers decreasing naturally only with the return of cold winter weather. The region has a diverse population of growers and a corresponding diversity in management approaches and resource availability. Grower engagement in the ACP/HLB management program is variable. The terrain can be challenging for pest management activities including ground rig insecticide application. Commodity survey refusal rates are significantly higher in this region relative to the other Southern California regions. The recent HLB detections in the Santa Paula area have resulted in a large area of commercial citrus and a number of packing facilities moving into a quarantine zone. The low lemon price over recent seasons has had an impact on the ability of growers to carry out treatments. There is no PCD, but the Ventura Co Task Force is highly engaged, while the Santa Barbara industry is mainly focused on a small and quite cohesive group of growers. In both counties, a key group of PCAs and growers together with the GLs, the CPDPC rep, the Agriculture Commissioners' offices, and UC scientists provide collective leadership and decision making. PCAs in the region already collect and compare ACP phenology data and use an ACP phenology model prototype to help in decision making. The Task Force and Santa Barbara growers have also pushed for new research on thresholds and stronger IPM approaches.

**Key needs in building regional approach:** prioritize defense of commercial citrus, improve regulatory survey efforts, additional resources to manage issue locally.

#### **Northern Santa Barbara, SLO and Monterey**

This is a large, diverse region with a relatively low density of commercial citrus production in the landscape, few large urban areas, and production is somewhat isolated from other major commercial citrus areas. Significant production occurs around Santa Maria, Nipomo and on the western side of the Salinas Valley. ACP populations have historically been sporadic, with low population sizes except for a few notable outbreaks. Highly suitable conditions for ACP population growth generally occur only between May and October, with a lack of development degree days during the first three to four months most years.

**Key needs in building regional approach:** A local decision-making committee and resources for local decision making. An emphasis on sanitation to reduce introduction of ACP and CLAs from other production areas. Focus urban program on high risk areas closest to commercial citrus.

### **The San Joaquin Valley**

The majority of the state's citrus production and processing is located here. The valley does not have a resident ACP population, but does experience regular detections of individuals and small isolated populations, particularly in the fall of each year. Favorable conditions for ACP development are typically compressed by cold winter/spring conditions and interrupted by periods of excess heat in mid-summer. Influx of bulk citrus from southern California for processing represents an ongoing risk of introduction, but tarping for inter-region movement of loads from areas with ACP has had a demonstrable effect of reducing ACP detections along transport routes. The level of organization within the industry is high, with PCDs and an active Task Force both playing a role in organizing coordinated treatments and surveillance.

**Key needs in building regional approach:** a local decision-making committee from existing PCD/Task Force membership and resources for local decision making. Maintain good history of prevention and rapid response.

### **The Sacramento Valley**

There are small, localized, areas of commercial citrus production in counties to the north of the I80 corridor. There have been small numbers of ACP detections along I80 and in Sacramento, but the region's small citrus acreage and relative isolation from the rest of citrus production mean that it currently is at a low risk level. There are no existing local loci of decision making connected with ACP/HLB management and the scattered nature of the acreage would make coordination difficult. The climate is generally highly favorable for ACP development only during the middle of the summer and early fall. Due to the differences in current ACP levels and commercial production volume and density, this region was not included in the management chart. Suggested activities for this region include the following:

- Retain oversight by CPDPC directly
- Continue to support some surveillance in highest risk urban centers and along I80 to act as sentinels for ACP arrival in region
- Encourage growers to use sticky panel traps for monitoring in conjunction with local UCCE offices
- Use ACP phenology and CLas infection risk model to monitor seasonal variation in risk
- Encourage citizen science monitoring efforts along with regional UCCE and CPDPD outreach activities.

Suggested Activities	Coastal San Diego	Coachella, Imperial	Riverside, San Bernardino	Ventura, So. Santa Barbara	No. Santa Barbara, SLO, Monterey	San Joaquin Valley
Create (Continue) local committee with CPDPC reps, GL, PCD reps, county Ag Commissioner's office and key PCAs	X	X	X	(X)	X	X
Establish (Continue) ACP phenology data collection in commercial citrus	X	X	X	(X)	X	
Use ACP phenology and CLas infection risk model to monitor seasonal variation in risk	X	X	X	X	X	X
Use ACP canine detectors to find ACP at low densities		X			X	
Test ACP from commercial citrus for CLas levels to assess risk of infection	X	X	X	X	X	
Track timing and type of ACP or ACP-effective treatments applied in PCD and cooperating commercial citrus	X	X			X	
Focus <i>T. radiata</i> releases on non-cooperating or low management 25+ or small scale commercial citrus	X		X	X		
Focus <i>T. radiata</i> releases around known HLB quarantines				X		
Coordinate <i>T. radiata</i> releases with treatments to maximize benefits	X		X	X		
Outreach to homeowners and municipalities about encouraging natural enemies through planting choices and replacing old/unwanted citrus with alternatives	X		X	X		
Outreach to encourage removal of backyard citrus close to commercial production		X			X	X
Encourage phytosanitary BMP for field crews, equipment, bulk citrus transport, etc. to minimize disease spread and to maximize the benefit of regional isolation	X		X	X	X	X
Implement urban survey plan to start in STR grids closest to commercial citrus and work back towards known HLB locations	X		X	X		
Focus non-commercial surveillance on highest risk STRs closest to commercial citrus (and work back towards urban areas)		X			X	X
Maintain effort on coordinated treatments when ACP are detected or predicted risk is high.						X

All activities are recommended but the activities highlighted above are expected to be especially helpful in these areas.