2011 PROJECT REPORT

Growing the California Pear Sustainability Story: Continued Practices Program Implementation

2011 was the second year of a three-year project jointly funded by a USDA Specialty Crop Block Grant and the Pear Pest Management Research Fund (PPMRF) – Developing a Sustainable Practice Benchmark Tool for California Pears. The 2011 activity resulted in additional grower participation in a second benchmark survey that contained additional practice areas, enabled a second marketing campaign for the California pear industry and provided a strategic platform for a restructured California Pear Advisory Board (CPAB).

The 2010-2011 survey included the new Air Quality and Energy Efficiency Practices sections. As a result of potential regulatory issues around water and greenhouse gases (i.e., energy usage), the committee also agreed to add some quantitative metrics to the survey, so suggested metrics were drafted, reviewed with the committee, and added to the survey. It should be noted that with the exception of nutrient applications, quantitative data was provided by a minority of survey respondents which reflects broader challenges in other initiatives such as the Stewardship Index for Specialty Crops to engage growers in metric data activity. Nutrient application data results were shared with UC researchers to help them better understand onfarm practices for their research planning.

The statistics from the 2010-2011 survey representing 74% of industry acreage were compiled, analyzed, and put into report form for both individual growers and for the industry as a whole. SureHarvest staff analyzed the data, cleaned typographic errors, generated graphs and data points, and refined multiple report formats.

In conjunction with Marilyn Dolan of The Communications Department, SureHarvest developed an executive summary of the 2010-2011 survey results. Upon completion of the executive summary, SureHarvest staff assisted in editing the news release on the survey results.

Once the executive summary and press release were made public, SureHarvest staff assisted Ms. Dolan and CPAB staff in answering questions from reporters which were generated by the press release.

As previously mentioned, custom reports were generated for each participant in the 2010-2011 survey. These reports were distributed to the appropriate growers at the targeted education workshops held in conjunction with the production research meetings held in January/February, 2011.

SureHarvest staff continued working with Bob McClain and UC Cooperative Extension staff to review historical production research activities from a sustainability perspective to augment the industry-level benchmark data to:

- Target additional research in low scoring areas
- Bridge historical research activities to current performance snapshot
- Help document the "good story" for the industry
- Help identify potential areas of research in underrepresented sustainability categories

SureHarvest staff also worked with CPAB's marketing agencies, The Communications Department and MJR Creative Group, to help develop a strawman strategy to incorporate sustainability as a key element of the California pear industry marketing activities. An outreach event is planned for early 2012 where supply chain aspects of sustainability will be discussed with growers and sales/marketing staff from shipper companies. Additional marketing activities supported by the sustainability program included pear growers sharing their sustainability stories via web-based videos (see Chuck Baker of Rivermaid Trading Company at http://www.youtube.com/watch?v=WdPiaeyjvR0).

A 2012 proposal has been submitted to PPMRF, outlining planned activities for year 3 of the three year project.

A USDA Specialty Crop Block Grant concept proposal was submitted to CDFA in December that includes the development of best practice brochures leveraging the current Pear Production and Handling Manual (ANR Publication 3483), elements of the Organic Pear Workbook, the Pear Sustainability Program content, and additional materials from UC groups that have not historically been involved with PPMRF in areas such as energy, employer practices, and biodiversity. This concept came up during discussions with UC Cooperative Extension, UC ANR leadership and pear shippers/processors. It will be used as a case study of putting UC ANR's new strategic vision and initiatives into practice through partnering with a small commodity group (i.e., pears) that has developed an industry sustainability Institute will work together with industry, private companies (e.g., PG&E) and USDA NRCS to develop a collaborative model for developing sustainability best practice materials.

Despite the continuing challenges of a poor global economy, there are increasing discussions of incorporating sustainability into the business planning process. Industries that are creating sustainability programs are seen as proactive leaders by both retail/foodservice companies and regulators. Continued concerns about environmental topics such as nutrient-related water quality issues are necessitating the development of farm planning and measurement/monitoring programs in California. The pear industry is well positioned to address these opportunities.

The phased development of a sustainable practices program continues to be the most costeffective approach for the pear industry combined with the active pursuit of grant funding opportunities to augment PPMRF funding. Leveraging this phased development via marketing channels such as the high exposure on the CPAB website (see below) is critical to sharing the good story that has been a fundamental desire of the program.



Appendices included with this report:

- 1. A copy of the executive summary of the 2010/2011 California Pear Sustainability Report
- 2. A copy of the full report
- 3. A copy of the Ag Alert press release
- 4. A sample page from the research sustainability analysis spreadsheet
- 5. A copy of the revised 2010/2011 survey

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CALIFORNIA PEAR SUSTAINABILITY PRACTICES SURVEY

2011 Executive Summary



SUSTAINABILITY FROM THE GROUND UP





Pear Pest Management Research Fund



INTRODUCTION

In 2009, the California pear industry conducted an initial assessment of its farmers to benchmark the adoption of Best Management Practices related to a number of key areas of "sustainability." In 2011, the assessment was repeated to reaffirm the baseline established in 2009, expand survey questions and increase the number of farmers participating in the assessment. This report is a summary of the findings from the 2011 assessment. Participation in the assessment did increase in 2011 with resulting data coming from farmers who represent 74 percent of the total California pear acreage in the state.

In both the 2009 and 2011 sustainability assessments, a significant percentage of California pear farmers demonstrate an exceedingly high level of adoption of many key indicators of sustainability. What seems clear from these assessments is that California pear farmers know they are growing healthy food for a global community and that they are taking an intentional and thoughtful long-term approach in how they care for the land, environment, resources and communities where they live and work.

About the Assessment

The practices assessed in this survey were identified by a committee of California pear farmers, handlers (packers and processors), crop consultants, and representatives of the California Pear Advisory Board and the Pear Pest Management Research Fund. Input and facilitation was provided by SureHarvest Inc., a leading agricultural sustainability program design firm.

The best practices assessed were related to the following areas:

- General Farm Management
- Integrated Pest Management
- Soil & Nutrient Management
- Energy Management
- Air Quality
- Water Management
- Ecosystem Management
- Employer Practices
- Social Issues

The list of practices drew heavily on the University of California's Pear Year-round IPM Program Annual Checklist and the SYSCO Farm/Ranch IPM/Sustainable Audit Checklist v09.01. SYSCO is a major purchaser of California pears for processing and its sustainability program has been influential in the world of food processing.

KEY FINDINGS

The California Pear Legacy

Dating back to the California Gold Rush, California pear farmers have a history of a commitment to safe, sustainable and healthy farming. Pear orchards in California are some of the oldest on record to still be producing commercially. Results of the 2011 assessment reveal the average age of a California pear orchard ranges between 33 and 100 years old, with some of the oldest plantings dating back to the 1840s. Many of today's pear farmers are still farming orchards handed down to them by their grandparents or great-grandparents and most hope to pass their farms on to their own children and grandchildren.

This trend in multi-generational farming necessitates production practices that are sustainable and ensure the health of soil, trees and natural resources for future generations. California pear farmers are literally pioneers in the area of environmentally-friendly pest management practices. The industry has been conducting research into Integrated Pest Management (IPM) strategies for decades and this is a key reason for the extremely high adoption of IPM farming practices found in this assessment of pear farmers.

Modern commercial pear farming is an extremely competitive business. Marginal prices, sometimes below the cost of production, have taken a toll on the number of pear farmers who remain in business. Where once the state had over 300 pear farmers, today there are just 60. Those who are left must use their resources wisely and they have learned to band together to fund marketing programs and conduct important research necessary to thrive and prosper.

The California pear farmer who remains in business today is, by necessity, smarter and more efficient than ever before. These farmers rely on family members, neighbors and fellow pear farmers in order to prosper and contribute back to the community. Today's California pear farmer perfectly fits the model of the "ideal" farmer many of today's consumers say they are looking for. California pear farmers are basically growing and harvesting fruit like they have done for generations, but they have employed new technologies to reduce pesticide use and preserve the environment. They are by and large small, non-corporate, family-owned businesses, who care and support the people in their communities. If the California pear industry were ultimately not to survive, it would be a significant loss for the rural communities where they farm and for consumers who enjoy California pears.

Profile of the California Pear Farmer





average size of California pear orchards



Number of

in state

pear farmers

Produces majority of fresh pears in summer month of July and August

The California Pear Community

While strong, the California pear community is small with approximately 60 pear farming operations in business today. These farmers represent a significant portion of the pears produced in the U.S. during the summer months when California farmers are harvesting the only fresh pears in the country.

The average size of a California pear farm is 130 acres which are self-owned and operated. On average, California pear farmers report they farm pears on an additional 140 acres which they do not own themselves. These figures indicate the California pear industry is not made up of large corporate farming interests.

The California pear industry is a close knit community. All California pear farmers support the activities of the California Pear Advisory Board. One of the most important functions of this Board has been to commission production research projects which have lead to the widespread adoption of Integrated Pest Management practices. All pear farmers continue to support this research through mandatory assessments, or self-imposed "taxes," which fund the California Pear Board's research. In addition, the 2011 Sustainability Assessment shows that 69 percent of pear farmers directly support research activities by directly providing funds, equipment or supplies to researchers and 63 percent allow scientists to use their orchards for research purposes.

The sustainable practices employed by the majority of California pear farmers make them excellent neighbors in the small, rural communities where pears tend to be grown. California pear farming areas are arguably in some of the most beautiful places in the state. The beauty of historic pear orchards contribute significantly to the appeal of communities such as Courtland and Clarksburg located in the Sacramento River Delta growing region; Lakeport and Kelseyville in the Lake County pear growing district; and Ukiah in the Mendocino growing district.

California fresh pears are all harvested by hand and thus require a significant amount of labor, particularly during harvest. As with all of California agriculture, farm workers are an important and valued resource. Because pear farmers compete with many other produce farming operations which also require significant hand labor, the labor market is competitive. Pear farmers have found they must meet or exceed others when it comes to farm worker wages. If not, they may find themselves without enough labor to harvest their crop. As a result, California pear farmers know the value of a work force that is treated well and paid fairly. Most pear farmers note the importance of ensuring that harvest crews return to their orchards for harvest each year. Thus a high percentage, 86 percent, provides housing for their workers.

California pear farmers also report they are committed to healthy relationships with the other businesses and residents of the communities where they live and work. Thus they strive to protect the quality of life, support the economy and contribute to local events and causes. Sustainability assessment results bear this out. Below are some excerpts which demonstrate that pear farmers are utilizing "neighborly" farming practices.

California Pear Farmers are Good Neighbors



...of California pear farmers are employers in the communities where they farm.

- ...chip, rather than burn orchard waste, to improve air quality.
- ...maintain vegetation or cover crops in orchard row middles to reduce dust, prevent soil erosion and limit tractor operations.
- ...have a written, updated plan to manage and reduce pesticide drift incidents.



...apply fertilizers at, or below, recommended University rates to enhance and protect soil and water quality.

- ...employ practices to protect properties outside of their farming operations from soil erosion.
- ...use sprinkler, micro-sprinkler or drip irrigation to reduce water usage.
- ...use tissue nutrient testing to plan fertilizer rates which ensures they do not over-fertilize.



...maintain a portion of their farm property in an undeveloped state with potential for wildlife benefits.

These are all hallmarks of sustainability and are a sure indication that the California pear industry is a small, but innovative, group which has come together to help do big things.

Stewardship on California Pear Farms

When it comes to environmentally-friendly farming practices, specifically those involving Integrated Pest Management (IPM) strategies, California pear farmers have an exceptionally high level of adoption. Virtually all farmers report they employ pest control advisors to scout orchards for pests before making any decisions to treat with pesticides, 97 percent use pheromone traps for monitoring key pear pests and 91 percent use pheromones to control pests.

These are all key components of an integrated IPM system which strives to control pests through means other than application of pesticides. This high level of adoption of IPM practices in California pears is higher than many other crops produced in the state and has drastically reduced the use of older, broad-based pesticides. Instead of turning to these older pesticides, pear farmers more often utilize non-pesticide treatments, incorporate beneficial insects and opt for newer, reduced risk pesticides that target specific pests only when IPM techniques are not enough.

A long-term analysis of the California Department of Pesticide Regulation's Pesticide Use Report, which is a mandatory reporting system required whenever a California farmer makes a pesticide application, shows that California pear farmers have reduced their use of the most highly restricted category of pesticides --organophosphate and carbamate compounds -- by 91 percent in the past 12 years.

Perhaps the most crucial factor in California pear farmer's success in reducing pesticide use is the advancements they have achieved in pheromone mating disruption techniques to control codling moth, which is the California pear industry's primary pest. This mating disruption technique uses dispensers (usually via twist ties applied to pear tree branches) which release a synthetic version of female codling moth pheromone. In nature, males are attracted to and locate female moths by sensing natural pheromones released by the females. When adequate amounts of synthetic pheromones are released into the orchard, male moths become confused and are unable to tell the difference between the scent of a female moth and the scent of the synthetic pheromone. The males are then limited in their ability to locate females for mating and, thus, future codling moth populations are significantly reduced.

Not surprisingly, since California pear farmers rely heavily on IPM farming techniques, 91 percent report that farm employees participate in IPM/Sustainable training beyond what is legally required.

When pesticides are applied, pear farmers report that trained personnel collect comprehensive data when making application decisions. For example, 88 percent of California pear farming operations consider the potential for residue on the crop at harvest and opt for those with the least potential for residues; 81 percent collect data on the impact of pesticide applications on aquatic invertebrates; 78 percent consider impact on beneficial insects; 75 percent consider chronic toxicity to mammals; and 72 percent consider potential water quality problems. In addition, 75 percent consider availability of alternative pesticide formulations that are more environmentally-friendly.

The end result is that the California pear farmers are making every attempt to reduce their use of pesticides by maintaining a balance among beneficial and predatory pests and always seeking to use the most environmentally-friendly option when it comes to pesticide use.



Environmental-Friendly Pear Farming

"California pear farmers know they are growing healthy food for a global community and that they are taking an intentional and thoughtful long-term approach in how they care for the land, environment, resources and communities where they live and work."

Commitment to Health

California pears are healthy food and farmers work to keep them that way. As noted above California pear farmers are committed to arowing a product with the least amount of pesticides possible. As a result, pesticide residues on pears are extremely low. As with all other produce items, pesticides approved for use on pears must undergo strict testing to ensure safety with additional factors built-in to protect infants and children. Pears are regularly monitored as part of both national and California monitoring programs designed to ensure that pears sold in stores are safe for consumption. The vast majority of pears tested have either no detectable pesticide residue at all, or the residues are well below safety limits established by the United States Environmental Protection Agency. According to toxicologists, who have analyzed data concerning pesticide residues found on pears, when pesticide residues are found on pears they are so small that a child could consume 851 servings of pears without any health effects at all.

Not only are pears safe for consumers, but California pear farmers also take steps to protect workers who labor in their orchards. An analysis of pesticide laws in California

shows that whenever a pesticide is applied, farmers are subject to 70 different regulations to protect the environment, workers and consumers. Further, California pear farmers report that 96 percent of their work force receives training in safety to prevent accidents and protect workers.

When it comes to nutrition, California pears are low in calories, contain no fat, cholesterol or sodium; they are high in fiber, a good source of vitamin C and they contain natural antioxidants. A diet rich in fruits and vegetables, such as pears, has been linked to reduced risk of heart disease and some cancers. In addition, GMOs are never used in the production of California pears.

Because pears are a healthy fruit, California pear farmers have adopted a cause which draws attention to the importance of diet in reducing disease. One hundred percent of fresh California pear farmers commit a portion of their assessments to support a program known as "Pears Care." This campaign is designed to raise awareness and funding for the Susan G. Komen for the Cure® Foundation which is devoted to ending breast cancer. As part of the regular marketing activities of many pear shippers, pears are packed in special pink boxes with the Susan G. Komen for the Cure® logo and the pink ribbon associated with the fight against breast cancer. These boxes are sold in retail produce departments throughout the country, not just during October, which is National Breast Cancer Awareness Month, but for the entire California pear shipping season. A financial contribution

> to Susan G. Komen for the Cure is provided by the California Pear Advisory Board to support this important cause.



Areas for Improvement

While this assessment confirms that California pear farmers are some of the most sustainable farmers in operation today, it must be recognized there is always room for improvement and that sustainability is something that, by its nature, should be continually advanced. Toward this end, California pear farmers have identified some specific areas where best practices have a lower percentage of adoption. These areas have been targeted for improvement and a series of grower meetings have been held to communicate the importance of advancements and where further research may be warranted. Examples of areas where the California pear industry has identified the need for improvement include:

- 55% of growers do not have a written nutrient management plan. This practice is increasingly seen as a responsible methodology for both minimizing fertilizer impacts on the environment and also finding economic efficiency with today's high fertilizer prices.
- 48% have not tested organic matter levels in the soil in the past 5 years. Organic matter is known to have multiple nutrient management benefits.
- 40% have not done a pump efficiency test in the past 5 years. These tests can identify repair needs that can save significant energy and make irrigation more efficient.
- 13% of pear farmers produce some electricity from solar and 7% produce some electricity from wind. Economic alternative energy supplies should continue to be pursued.

Conclusion

Findings from the 2011 California Pear Sustainability Survey indicate the California pear farmers are among the most sustainable food producers today. The California pear industry is committed to educating individual farmers, packers, shippers and processors so that sustainable practices can be enhanced and advanced. A complete copy of California pear farmer survey results is available on request from the California Pear Advisory Board or your California pear supplier. A documentary film which summarizes the sustainability survey findings and features interviews with California pear farmers is available for viewing at www.calpear.com.





About the California Pear Advisory Board

Established in March 1992, the California Pear Advisory Board (CPAB) is a state agricultural marketing order covering both fresh and processed pears produced in California. Its programs include education, research, standardization and the cumulating of industry statistics and information.



Pear Pest Management Research Fund

About the Pear Pest Management Research Fund

The Pear Pest Management Research Fund is a non-profit mutual benefit corporation formed in the early 1990s where pear growers and processors have come together to fund scientific research to improve existing methods, develop new methods and educate others about methods to grow and process pears that are economical and safe for consumers and the environment.



About SureHarvest, Inc.

Since 1999, SureHarvest, Inc. has provided solutions for growers and agri-food companies pursuing sustainability strategies – to increase efficiencies, enhance product quality and practice environmental stewardship.

2011 Pear Sustainability Survey Results

Total Assessed Acres in Survey: 7,765 (74% of industry total)

Q2. What is the number of acres of pears that you own:

Average Response: 130

Q3. What is the number of acres of pears that you farm IN ADDITION TO those you own (if any):

Average Response: 144

Q4. Orchard Age

Average year planted (oldest orchard): 1912 Average year planted (youngest orchard): 1978

Year planted of oldest orchard: 1842

Q5. Have you applied biosolids (treated sewage sludge) on your orchard in the last year? (Check with your shipper/packer or processor for limitations on use of biosolids. Many of their customers do not allow its use.)

Yes: 0% No: 100% Not Applicable: 0%

Q6. Are there any 'genetically modified' (GMO) pear trees in your orchard(s)?

Yes: 0% No: 97% Not Applicable: 3%

Q7. In the past year, have you burned waste in your orchard(s) (other than diseased/infested prunings or materials you are legally mandated to burn such as certain types of pesticide containers)?

Yes: 6% No: 94% Not Applicable: 0%

Q8. In the past year, have you chipped all orchard prunings?

Yes: 94% No: 6% Not Applicable: 0%

Q9. If you removed an orchard in the past year, were the trees chipped?

Yes: 21% No: 24% Not Applicable: 55%

Q10. In the past year, did you recycle any materials used in orchard operations - such as plastic containers, bags, pesticide containers, etc.?

Yes: 81% No: 16% Not Applicable: 3%

Q11. In the past year, did you participate in any on-site environmental and/or social practice audit programs (e.g., GlobalGAP, Food Alliance, Fish Friendly Farming)? If so, please list the program(s) in the comment box.

Yes: 23% No: 77% Not Applicable: 0%

Q12. In the past year, did you give money, equipment, or supplies to support research projects?

Yes: 69% No: 31% Not Applicable: 0%



Q13. In the past year, did you conduct (or allow researchers to conduct) on-farm research in your orchard(s)?

Yes: 63% No: 37% Not Applicable: 0%

Q14. If research was done on your farm, was the research conducted with scientific, statistically valid methodologies?

Yes: 100% No: 0% Not Applicable: 0%

Q15. During dormant season, beating tray samples were taken for pear psylla adults (the recommended rate is 100 samples per 20-acre block).

Yes: 89% No: 4% Not Applicable: 7%

Q16. During the dormant season, the following activities were performed:



Q17. In areas where frost and russetting are likely, weeds and ground cover were eliminated before bloom. In areas where frost and russetting are less likely, resident vegetation or cover crop was mowed before bloom.

Yes: 97% No: 3% Not Applicable: 0%

Q18. If the orchard is in the Central Valley, did you monitor hours during the dormant season for chilling requirement?

Yes: 41% No: 3% Orch

Orchard is not in the Central Valley: 56%



Q19. Scouting activities during the past year were primarily done by a:

Q20. During bloom, flower clusters were examined for:



Q21. Pheromone traps were placed in the orchard for codling moth and other lepidopterous pests in March or as conditions became favorable.

Yes: 97% No: 3% Not Applicable: 0%

Q22. Consperse stink bug is monitored in early April or as conditions become favorable.

Yes: 88% No: 9% Not Applicable: 3%

Q23. Pheromone traps were checked at least weekly and counts recorded.

Yes: 97% No: 0% Not Applicable: 3%

Q24. Mating disruption for codling moth was used and pheromone dispensers were placed in the orchard at biofix.

Yes: 91% No: 9% Not Applicable: 0%

Q25. Weather conditions are monitored in the spring for hours and temperature of wetting to forecast pear scab potential.

Yes: 97% No: 3% Not Applicable: 0%

Q26. If pear scab was treated, leaves and emerging fruit are checked for pear scab lesions after an infection period to assess the effectiveness of treatment.

Yes: 100% No: 0% Not Applicable: 0%

Q27. Weather conditions are monitored in the spring for degree hours and precipitation to forecast fire blight.

Yes: 91% No: 9% Not Applicable: 0%

Q28. At least twice in the past year the orchard has been monitored for the following vertebrate pests:



Q29. From petal fall to harvest, scouting was done:



Q30. From petal fall to harvest, leaf samples were taken and examined for:







Q32. Degree days were monitored and recorded for codling moth beginning with biofix and traps are monitored throughout the season through mid-September.

Yes: 97% No: 3% Not Applicable: 0%

Q33. At 800 to 900 degree-days from biofix, fruit is monitored for damage.

Yes: 91% No: 9% Not Applicable: 0%

Q34. Scouting included checking cover crops and weeds for:





Yes: 100%

No: 0%

Not Applicable: 0%



Q36. During harvest fruit was checked for feeding damage caused by:

Q37. Post harvest, top shoots were checked for:



Q38. Fruit left on trees after harvest was sampled for coding moth and/or damage.

Yes: 69% No: 28% Not Applicable: 3%

Q39. Do you have an orchard floor vegetation management plan?

Yes: 97% No: 3% Not Applicable: 0%





Q41. Do you use a custom applicator for pesticides applications?

Yes: 12% No: 88% Not Applicable: 0%

Q42. For commonly applied pesticides, the following data sources have been collected by the person responsible for application decisions:



Q43. For pesticides applied in the past year, the following data sources have been collected by the person responsible for application decisions:



Q44. Complete, legible pesticide application records are kept available and maintained for at least three years. Records include target pest, date, time, location, material applied, rate, applicator, application method, weather conditions, estimated or measured wind speed.

Yes: 100% No: 0% Not Applicable: 0%





2011 Pear Sustainability Survey Results, 9

Q46. Staff members most directly responsible for pest management have met the minimum continuing education requirements for pesticide applicator licensing/certification.

Yes: 100% No: 0% Not Applicable: 0%

Q47. Staff members most directly responsible for pest management have participated in IPM/sustainable ag training events in the previous year beyond minimum legal requirements.

Yes: 91% No: 6% Not Applicable: 3%

Q48. Does your operation maintain organized legal documentation pertaining to pesticide usage?

Yes: 97% No: 3% Not Applicable: 0%

Q49. Does your operation maintain organized records on pesticide applicator licensing/certification for its applicators?

Yes: 90% No: 0% Not Applicable: 10%

Q50. Does your operation maintain organized legal documentation pertaining to worker protection standard/ right-to-know material and availability of personal protective equipment (PPE) for pesticides used?

Yes: 97% No: 0% Not Applicable: 3%

Q51. In the past two years, has your operation been cited for chemical application violations?

Yes: 13% No: 84% Not Applicable: 3%

Q52. If yes, have all the citations been resolved or in the process of being resolved?

Yes: 100% No: 0% Not Applicable: 0%

Q53. In the past year, your operation has written or updated a drift management plan containing the following information:



Q54. In the past three years, has the operation been cited for off-target application of agrochemicals (i.e., drift)?

Yes: 6% No: 94% Not Applicable: 0%

Q55. If so, have you documented the response internally?

Yes: 100% No: 0% Not Applicable: 0%

Q56. In the past year, have you developed or updated a written nutrient management plan?

Yes: 45% No: 55% Not Applicable: 0%

Q57. In the past year, have you taken or done tissue nutrient testing at least once to determine macro-and micronutrient levels in the tree tissues?

Yes: 71% No: 29% Not Applicable: 0%

Q58. Does your nutrient management plan use previously recorded nitrogen use efficiency rates (e.g., total N per acre) to forecast orchard nutrient needs?

Yes: 80% No: 17% Not Applicable: 3%

Q59. In the past year, correlated to your tiss	were your application r ue testing results?	ates kept at or below university recommended rates, as
Yes: 80%	No: 13%	Not Applicable: 7%
Q60. Do you track and	l record information on	nutrient applications made to your orchards?
Yes: 84%	No: 16%	Not Applicable: 0%
Q61. Do you maintain	nutrient application red	cords for a minimum of three years?
Yes: 77%	No: 23%	Not Applicable: 0%
Q62. Do you use fertig	gation technology to ap	ply nutrients?
Yes: 42%	No: 55%	Not Applicable: 3%
Q63. Does your opera	tion maintain records p	pertaining to nutrient applications?
Yes: 81%	No: 16%	Not Applicable: 3%
Q64. Have you tested	soil organic matter in t	he last five years?
Yes: 49%	No: 48%	Not Applicable: 3%
Q65. Have you tested	soil salinity levels in th	e past five years?
Yes: 48%	No: 41%	Not Applicable: 10%
Q66. Are the row mide	lles of your orchard ma	intained in resident vegetation or cover cropped?
Yes: 87%	No: 10%	Not Applicable: 3%
Q67. In the past two y	ears, have you added s	oil organic matter amendments?
Yes: 19%	No: 77%	Not Applicable: 3%
Q68. The farm propert reduced or corrected	y outside of the orchar through one or more of	d has no visible erosion, OR erosion potential is being i the following techniques: windbreaks, terraces, cover crop

ops, mulches, contours, managed drainage, buffer or filter strips, minimum tillage.

Yes: 84% No: 6% Not Applicable: 10%

Q69. Orchard(s) has no visible erosion, OR erosion potential is being reduced or corrected through one or more of the following techniques: terraces, cover crops, mulches, contours, managed drainage, buffer or filter strips, minimum tillage.

Yes: 80% No: 10% Not Applicable: 10%

Q70. How many lbs of macro nutrients did you apply to this orchard for 2010?



Q71. In the past year, have you written or updated a water management plan for your orchard(s)?

Yes: 29% No: 68% Not Applicable: 3%

Q72. In the past year, did you track and record information on irrigation applications made to your orchard(s)?

Yes: 87% No: 13% Not Applicable: 0%

Q73. What percentage of your operation is on the following irrigation system types?



Q74. If your operation	uses flood/ furrow irriç	gation, was the orchard(s) laser leveled prior to planting?
Yes: 18%	No: 82%	Not Applicable: 0%
Q75. Do you use soil r	noisture monitoring de	vices?
Yes: 52%	No: 45%	Not Applicable: 3%
Q76. Do you use an ev	vapotranspiration (ET)	model to schedule irrigations?
Yes: 30%	No: 67%	Not Applicable: 3%
Q77. Have you tested	conveyed irrigation wa	ter annually for nutrients, pH and salinity?
Yes: 13%	No: 84%	Not Applicable: 3%
Q78. In the past five y	ears, have you sampled	d well water used for irrigation for nutrients, pH and EC?
Yes: 48%	No: 39%	Not Applicable: 13%
Q79. In the past year,	has your irrigation wat	er been tested for bacterial levels?
Yes: 29%	No: 71%	Not Applicable: 0%
Q80. Does your opera water?	tion irrigate with "gray'	' water (treated water from sewage facilities) as irrigation
Yes: 0%	No: 100%	Not Applicable: 0%
Q81. Have you done a	pump efficiency test ir	n the past five years?
Yes: 60%	No: 40%	Not Applicable: 0%
Q82. Are flow meters i	installed on at least sor	ne of your pumps?
Yes: 39%	No: 61%	Not Applicable: 0%
Q83. If so, did you rec	ord your water volume	usage?
Yes: 83%	No: 17%	Not Applicable: 0%
Q84. How many acre i	nches of water did you	APPLY as irrigation to this orchard for 2010?
Average Acre Inches: 2	9	
Q85. Have you conver years?	ted any environmental	ly sensitive areas to pear production within the past three
Yes: 0%	No: 100%	Not Applicable: 0%
Q86. Do you have a cu areas are those areas environmental damag species habitat, chem	urrent map of your orch on or around your farn e, such as surface wate ical storage sites, drair	hard(s) identifying environmentally sensitive areas? (Sensitive in that are either potential sources of hazards or susceptible to er bodies, wetlands, wellheads, endangered/threatened hage areas, fuel tanks, or dwellings.)

Yes: 39% No: 58% Not Applicable: 3%

Q87. Does your map delineate buffer zones around sensitive areas?					
Yes: 32%	No: 42%	Not Applicable: 26%			
Q88. Are sensitive are these areas?	eas marked by signs or	fenced off to prevent activities which might negatively impact			
Yes: 19%	No: 52%	Not Applicable: 29%			
Q89. Are filter strips e	established around ripa	rian or drainage areas of your property(ies)?			
Yes: 36%	No: 45%	Not Applicable: 19%			
Q90. In the past three property?	years, have you identi	ied and taken action to remove invasive plants on your			
Yes: 78%	No: 19%	Not Applicable: 3%			
Q91. Is a portion of yo	our property maintained	in an undeveloped state?			
Yes: 50%	No: 47%	Not Applicable: 3%			
Q92. In the past 12 mo the status and any co	onths have you visually rrective actions you ha	r monitored sensitive areas in your orchard(s) and recorded ve taken to protect the area?			
Yes: 27%	No: 53%	Not Applicable: 20%			
Q93. Are pesticides s	tored on the farm in a le	ocked containment area?			
Yes: 97%	No: 0%	Not Applicable: 3%			
Q94. Are pesticides s	tored within a seconda	ry containment device or structure?			
Yes: 29%	No: 68%	Not Applicable: 3%			
Q95. Is a spill respons	se/cleanup kit in the pe	sticide storage facility?			
Yes: 81%	No: 16%	Not Applicable: 3%			



Q96. Do you have a written environmental emergency plan addressing the following issues?:

Q97. Have you experienced an environmental emergency in your orchard operations within the past three years?

Yes: 0% No: 100% Not Applicable: 0%

Q98. Do you have employees in your orchard operations?

Yes: 94% No: 6% Not Applicable: 0%



Q99. From the list below, which employee policies or practices do you have for your operations?:

Q100. Does your operation maintain organized legal documentation pertaining to employee health and safety?

Yes: 83% No: 17% Not Applicable: 0%

Q101. Are speed limits posted on unpaved roads to reduce dust generation?

Yes: 23% No: 77% Not Applicable: 0%

Q102. Is vehicle access to unpaved roads physically restricted?

Yes: 32% No: 65% Not Applicable: 3%

Q103. Do you apply water or organic dust suppressants (e.g., road oil, polymers) or layers of mulches, chips, sand, or gravel to unpaved roads and/or equipment yards?

Yes: 87% No: 13% Not Applicable: 0%

Q104. Are at least some farm roads and/or equipment yards paved or maintained in vegetative cover.

Yes: 81% No: 19% Not Applicable: 0%

Q105. Are orchard row	r middles in mature oro	chards primarily maintained in vegetation?
Yes: 90%	No: 10%	Not Applicable: 0%
Q106. Are methods ot	ner than tillage used to	control weeds (e.g., herbicides, mowing, heat)?
Yes: 97%	No: 3%	Not Applicable: 0%
Q107. Do you have a v equipment and vehicle	vritten plan in place for es?	your orchard that sets guidelines to reduce passes by
Yes: 10%	No: 90%	Not Applicable: 0%
Q108. Is engine mainte	enance done on a regu	lar basis?
Yes: 100%	No: 0%	Not Applicable: 0%
Q109. Are low-emissio	n vehicles (e.g., flex fu	el, hybrids, biodiesel) used by your farming operation?
Yes: 7%	No: 90%	Not Applicable: 3%
Q110. Have engine em standards?	issions been reduced I	by retrofitting/replacing diesel engines to Tier III or IV
Yes: 13%	No: 84%	Not Applicable: 3%
Q111. In the past year, (may include pickups)	did you use alternativ ?	e fuels for vehicles in at least some of your orchard operations
Yes: 7%	No: 90%	Not Applicable: 3%
Q112. Have diesel eng (e.g., propane, natural	ines been replaced (or gas, biodiesel) or elec	retrofitted) with technology relying on cleaner-burning fuel tricity?
Yes: 26%	No: 74%	Not Applicable: 0%
Q113. Is irrigation gen lower?	erally done during off-	peak hours when ozone formation and water evaporation are
Yes: 81%	No: 19%	Not Applicable: 0%
Q114. Does the irrigati gravity-fed flood/furro	on system for this orcl w system)?	hard have no emissions (e.g., solar-powered pumping system,
Yes: 22%	No: 78%	Not Applicable: 0%
Q115. Is extra effort m use of emulsifiable co	ade to reduce VOCs duncentrates and fumigation	uring the peak ozone period (May 1 to October 31) by avoiding nts and considering low-rate spray technologies?
Yes: 52%	No: 42%	Not Applicable: 6%
Q116. Are precision sp reduce pesticide use a	orayers (e.g., low-volun and increase on-target	ne sprayers, "smart sprayers" with remote sensors) used to deposition?
Yes: 23%	No: 74%	Not Applicable: 3%

Q117. Is your production in an orchard that requires frost production regularly?

Yes: 53% No: 47% Not Applicable: 0%



Q118. How do you track and record electricity use in your farming operation?

Q119. If you record and track annual electricity use per acre, what is that amount for 2010?

Insufficient Response

Q120. How do you track and record fuel use in your farming operation?



Q121. If you record and track fuel use per ton of fruit, what is that amount for 2010?

Insufficient Response

Q122. In the past 5 years, has the operation been audited by a qualified expert (e.g., utility representative or paid consultant) to identify opportunities to improve electricity use efficiency?

Yes: 32% No: 68% Not Applicable: 0%

Q123. In the past 5 years, have you developed an energy management plan and budget for short and long term (e.g., 1, 3 and 5 year) improvements?

Yes: 19% No: 77% Not Applicable: 3%

Q124. Are tire pressures for tractors and other vehicles checked regularly throughout the year to ensure proper inflation?

Yes: 90% No: 7% Not Applicable: 3%

Q125. Are tractors and other vehicles serviced and maintained regularly throughout the year, including timely replacement of oil, fuel, and air filters?

Yes: 97% No: 0% Not Applicable: 3%

Q126. Are lighter vehicles used for road trips that do not require a large vehicle (e.g., small pick-up instead of a large pick-up, car instead of a pick-up, etc.)?

Yes: 83% No: 17% Not Applicable: 0%

Q127. Are ATVs, bicycles, motorcycles, golf carts, self-propelled light spray rigs, or other small-engine vehicles used instead of tractors for on-farm transportation and for jobs requiring less horsepower?

Yes: 81% No: 19% Not Applicable: 0%

Q128. Are purchases of tractors or other motorized equipment based on calculated horsepower needs and fuel efficiency?

Yes: 87% No: 7% Not Applicable: 7%

Q129. Have you painted/coated above ground fuel storage tanks white or aluminum to reflect solar radiation (note that some air districts have restrictions on the type of paint which may be used).

Yes: 81% No: 19% Not Applicable: 0%

Q130. Are above ground fuel storage tanks shaded (if allowed under local regulations)?

Yes: 42% No: 48% Not Applicable: 10%

Q131. Do above ground fuel storage tanks use pressure-relief vacuum caps rather than conventional caps (if allowed under local regulations)?

Yes: 30% No: 67% Not Applicable: 3%

Q132. Are most or all of your shop/plant and yard lighting options more efficient than incandescent bulbs?

Yes: 70% No: 27% Not Applicable: 3%

Q133. Is your shop lighting designed with task or area lighting to allow work without lighting unused spaces?

Yes: 74% No: 23% Not Applicable: 3%

Q134. Do motion sensors or timers control your yard and/or shop lights?

Yes: 43% No: 57% Not Applicable: 0%

Q135. Is your shop lighting augmented with natural light from skylights or windows to reduce the need for electrical lighting during the day?

Yes: 87%	No: 13%	Not Applicable: 0%
Q136. Are your irriga	tion pump motors or en	gines maintained regularly?
Yes: 100%	No: 0%	Not Applicable: 0%
Q137. Has your irriga repairs or improveme	tion pumping system b ents made if appropriate	een tested for energy efficiency within the last three years (and e)?
Yes: 38%	No: 62%	Not Applicable: 0%
Q138. Is your irrigatio	on pumping done durin	g off-peak hours whenever possible (for electric pumps)?
Yes: 76%	No: 21%	Not Applicable: 3%
Q139. Are variable sp	beed drives installed on	pumps which have variable loads (for electric pumps)?
Yes: 13%	No: 67%	Not Applicable: 20%
Q140. Is solar energy	used to generate elect	ricity for your operation?
Yes: 13%	No: 87%	Not Applicable: 0%
Q141. Is wind power	used/generated by you	r operation?
Yes: 7%	No: 93%	Not Applicable: 0%
Q142. Does your ope sources?	ration have a contract v	with your electrical utility to purchase energy from renewable

Yes: 10% No: 90% Not Applicable: 0%



Pear growers update report on sustainability

Issue Date: August 10, 2011 By Steve Adler

As more farmers and ranchers focus on farming sustainably, California pear growers point out that they have been farming sustainably long before the term became well-known.

"Our pear growers have embraced an integrated pest management program for many years and there have been a lot of resources put into making it work," said Chris Zanobini, executive director of the California Pear Advisory Board. "From a growing standpoint, they were ahead of the curve in finding ways to control pests back before IPM was even the norm."

To update information on pear farmers' adoption of sustainable practices, the board asked farmers to complete a California Pear Sustainability Practices Survey. Administered by Sureharvest Inc., an agricultural sustainability program design firm, the survey follows one first completed by pear growers in 2009. Results from the updated survey are currently being tabulated and will be released soon, Zanobini said.

While definitions of sustainability differ among various users of the term, the CPAB defines it this way: "The concept and practice of balancing economic prosperity, environmental stewardship, and social responsibility so they together lead to an improved quality of life for ourselves and future generations."

Sustainable practices include general farm management, IPM, soil and nutrient management, energy management, water management, ecosystem management and employer practices, Zanobini said.

California pear growers demonstrate a high level of adoption of IPM practices. For example, 95 percent report scouting for key pests throughout the year in order to use pest control measures only when absolutely necessary. In addition, 95 percent of the farmers use mating-disrupting pheromones as their primary treatment for codling moths.

Pheromone dispensers—known as puffers because they periodically emit a puff of pheromone into the pear orchard—are the primary tool used today. But Zanobini said pheromone control really started many years earlier, with twist ties that were placed on pear trees in the Sacramento-San Joaquin Delta pear-growing region.

"The program was so effective that it expanded statewide, and then it went to a regional program that went from California all the way up into Canada," he said.

Fifth-generation delta pear grower Chuck Baker said he has been using pheromone confusion of codling moths for 15 years.

"We've sprayed no organophosphates at all. This requires a lot of monitoring, a lot more than in the past. Everything we use now is very targeted to a specific insect pest, and is very soft on beneficial insects," he said. "Actually, we do very little spraying at all. We work very hard at trying to do a better job of the way we farm the land. My kids grew up on an orchard, just like I did, and I want them to be safe."

Water efficiency is another sustainable practice that has been embraced by pear growers. Many growers report using soil moisture monitoring devices to determine their water status when planning irrigation, Zanobini said.

Baker added that the majority of growers have installed solid-set sprinklers and, in many instances, micro-sprinklers.

"We work very hard at water monitoring. We want all of our pumps to be efficient," he said.

Baker pointed out that the proof as to the success of the pear growers' sustainability efforts is the improved yields that they are achieving on fewer acres of pears than in the past.

"Our yields have never been this high. We have astronomical yields. If my grandfather or great-grandfather could see the kinds of yields we have today, they would be amazed. But they would also be very excited for us, because this is huge tonnage that we are getting now compared to what we used to get," he said.

The motivation to place more effort into educating the public about pear growers' sustainable practices came from the commodity's customer base, which wanted to see more sustainable farming operations.

"When we talk about sustainability, the whole driver behind that is really coming from the customer base, whether the fruit is going to the fresh market, the processing market, wherever it may be. There is a driving trend toward wanting to have sustainable production and sustainable operations," Zanobini said. "This started as a cooperative movement among growers and processors, but the real driver came from some of the big players on the processing side, the canned fruit side."

Baker said farmers have been working very hard in recent years to make the public aware of how sustainable they are.

"We always knew we are sustainable, and now we want the public to be aware of it as well. Sustainability is a moving target. Every retail supplier has its own definition. There is no single definition that is right, and so the pear industry has been working very hard in the past couple years to set up a sustainable program," he said. "We are very conscious of our duty to make this ground better off than it was when we inherited it."

(Steve Adler is associate editor of Ag Alert. He may be contacted at sadler@cfbf.com.)

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						R	Resource Affected			Sus	Sustainability Impact		
Project Name	Area	Year	\$ Amt	Water	Air	Soil	Wildlife Energy	Worker	Consumer	Economia	Environ	Social	
Areawide Management of Codling Moth in Mendocino Orchards -	CDPR Grant												
Lucia Varela, UCCE Sonoma Co.	Ento	2000	5,000	х	х	х		х		х	х		
Biologically Intensive Pest Management Program in Mendocino	CDPR Grant												
County Pear Orchards - Lucia Varela, UC IPM - North Coast IPM	Ento	2001	25,000	х	х	х		х		х	х		
Demonstration and Expansion of Areawide Use of Puffers to	CDPP Grant												
Control Codling Moth in Pears - Rachel Elkins, UCCE Lake Co.	CDFK Giani Ento	2000	20.000	v	v	v		v		×	×		
Evaluation of New Insecticides for True Rug Control in Pears - P	CDPR Grant	2000	20,000	X	X	X		X		X	X		
A Van Steenwyk LIC Berkeley	Ento	2000	24 000	v	v	v		v		×	×		
Finding Alternatives to Organophosphates in California Pears:	LINO	2000	24,000	^	^	^		^		^	~		
Building Biologically Intensive IPM Programs - Chuck Ingels	CDPR Grant												
UCCF Sacramento	Ento	2001	26,000	x	x	x		x		x	x		
Pear Pest Management Implementation Program for El Dorado		2001	20,000	~	~	~		~		~	~		
and Solano Counties - Chuck Ingels, UCCE Sacramento Co.													
Wilbur Reil, UCCE, Yolo/Solano: Randy Hansen, Weddle, Hansen	CDPR Grant												
& Assoc.	Ento	2000	6.500	x	х	х		х		x	x		
Pear Pest Management Implementation Program for Sutter and			-,										
Yuba Counties [Part 1: Control of Fireblight using the Biological													
Control Agent A506 \$3,368] [Part 2: Comparison of Mating													
disruption Strategies to Control Codling Moth \$6,632] - Rachel	CDPR Grant												
Elkins, UCCE Lake County	Ento	2001	10,000	х	х	х		х		х	х		
Pear Pest Management Implementation Program for the	CDDD Croat												
Sacramento River District - Chuck Ingels, UCCE Sacramento Co.	CDPR Grant	2000	26 701	v	Y	Y		Y		×	×.		
Poor Poot Management Program In Lake County - Rechol Elking	CDDB Cront	2000	20,701	X	X	X		X		X	X		
	Ento	2001	10 8/5	v	v	v		v		×	×		
Alternative Dispensing Technologies for Codling Moth - Steve	LINO	2001	19,045	^	~	~		^		~	~		
Welter LIC Berkeley	Ento	2004	13 692	v	v	Y		v		×	×		
Areawide Management of Codling Moth in Mendocino Orchards:	Ento	2004	10,002	~	X	Х		X		~	~		
Integrating and Maintaining Benefits of Selective Control of													
Seconday Pests - Lucia Varela, UCCF Sonoma County and													
Steven Welter, UC Berkelev	Ento	1998	CDPR							x	x		
Areawide Management of Codling Moth Using Pheromone Mating													
Disruption: Mendocino Pilot Project - Lucia Varela, UC Area IPM			USDA-ARS										
Advisor - North Coast	Ento	1997	39,746	х	х			х		х	х		
Areawide Management of Codling Moth Using Pheromone Mating													
Disruption: The Randall Island Pilot Project - S. C. Welter and Bob			USDA-ARS										
Van Steenwyk, UC Berkeley	Ento	1997	101,931	х	х			х		х	х		
Areawide Management of Codling Moth Using Pheromont Mating													
Disruption: The Randall Island Pilot Project - Stephen Welter, UC													
Berkeley	Ento	1998	USDA							х	х		
Areawide Management, Insecticide Resistance, Codling Moth													
Pheromone Mating Disruption - Steve Welter, UC Berkeley	Ento	1995	61,170	х	х			х		х	х		
Assessing Foraging and Roosting Habits of Bats - Rachael Long,													
UCCE Yolo County	Ento	2000	4,136	х	х	х		х			х		
Assessing Potential Cross Resistance to more Selective													
Insecticides in Laboratory Codling Moth Populations - Steve													
Welter, UC Berkeley	Ento	1999	8,673							х	х		
Attracting Bats to Farms for Pest Control - Rachael Long, UCCE	F . (4000	0.070										
YOIO County	Ento	1998	3,270	х	х			х		х	х	х	
Barriers to the implementation of Mating Disruption for Control of	C sta	1000	0										
Country Wolf - Fal Weddle	Ento	1993	ſ	х	х			х		х	х		
	Ento	1005	015	×	Y			v		~	~		
	EIIIO	1995	910	x	X			X		X	X	X	

2010 California Pear Sustainability Self-Assessment

1. Introduction & Instructions

The California Pear Advisory Board and the Pear Pest Management Research Fund (PPMRF) launched the California Pear Sustainability Self-Assessment in 2009 to address requests from key pear-buying companies for documentation of California Pear growers' sustainability and to start benchmarking the environmental, social, and economic aspects of the California Pear grower community.

A 2009 survey and the resulting data were used to promote California Pears with the general public and buyers. The 2010 survey has been refined and will strengthen the California Pear grower community benchmarking efforts and provide direction for investments in research or outreach. ALL INDIVIDUAL FARM SURVEY RESULTS WILL BE KEPT CONFIDENTIAL.

INSTRUCTIONS

- Please answer each of the questions in the following survey with a "Yes," "No," or "Not Applicable."

- "Not applicable" means that the question is not applicable to your operation. If you select this response, please provide a few words in the comment box explaining why it is not applicable.

- You can complete the survey in more than one session. When you access it again, you may pick up where you left off.

The survey should take approximately 30 minutes or less to complete.

Thank you for your participation!

YOUR RESPONSES WILL BE KEPT COMPLETELY CONFIDENTIAL.

1. Your name and contact information (names are kept confidential, but are needed to produce your private report):

Name	
Company	
Address	
Address	
City, State, Zip	
Phone	
E-mail	

2. What is the number of acres of pears that you own?:

3. What is the number of acres of pears that you farm IN ADDITION TO those you own (if any):

4. Orchard Age

What year was your oldest	
orchard planted?	
What year was your newest	
orchard planted (if you	
have more than one)?	
2. General Farm Management

1. Have you applied biosolids (treated sewage sludge) on your orchard in the last year? (Check with your shipper/packer or processor for limitations on use of biosolids. Many of their customers do not allow its use.)

there any 'genetically modified' (
there any 'genetically modified' (
there any 'genetically modified' (
	3MO) pear trees in your orchard(s)?	
i	jn No	
applicable (please explain briefly)		
ie past year, have you burned wa	ste in your orchard(s) (other than	
ed/infested prunings or material	s you are legally mandated to burn s	such as
types of pesticide containers)?		
,	j: No	
applicable (please explain briefly)		
ie past year, have you chipped al	l orchard prunings?	
i de la constante de	jn No	
annlicable (nlease explain briefly)		
ou removed an orchard in the pas	t year, were the trees chipped?	
i	in No	
	2	
applicable (please explain briefly)		

6. In the past year, did you recycle any materials used in orchard operations - such as plastic containers, bags, pesticide containers, etc.?

in Yes

in No

Not applicable (please explain briefly)

7. In the past year, did you participate in any on-site environmental and/or social practice audit programs (eg. GlobalGAP, Food Alliance, Fish Friendly Farming)? If so, please list the program(s) in the comment box.

in No

jn Yes (please specify)

	5
	6

8. In the past year, did you give money, equipment, or supplies to support research projects?

jn	Yes	jn	No
jn	Not applicable (please explain briefly)		

9. In the past year, did you conduct (or allow researchers to conduct) on-farm research in your orchard(s)?

jn No

jn	Yes			

3. Research Question

1. If research was done on your farm, was the research conducted with scientific, statistically valid methodologies?

jn Yes

jn No

4. Pest Management: Dormant/delayed-dormant season activities

The Pest Management section is based primarily on the UC Year-round IPM Program for Pears and thus is arranged by season.

1. During dormant season, beating tray samples were taken for pear psylla adults (the recommended rate is 100 samples per 20-acre block).

j'n	Yes		jn No	
jn	Not applicable (please explain briefly)			-
2. C	During the dormant season,	the following a	ctivities were p	performed:
ē	Dormant spurs were examined for Europea	n red mite eggs		
ê	Dormant spurs were examined for pear rus	t mite and pearleaf bliste	er mite	
ê	If sampling in February, dormant spurs wer	e examined for Pear psy	lla eggs	
ê	Presence/absence of predatory mites was r	ecorded		
ê	Shoots were examined for San Jose scale	and pear scab lesions		
ê	Scouting included looking under bark for n	nealybugs		
ê	None of the above			
Com	nment:			
3. lı elin veg	n areas where frost and rus ninated before bloom. In are getation or cover crop was r	setting are likel eas where frost nowed before b	ly, weeds and g and russetting bloom.	ground cover were are less likely, resident
jn	Yes		jn No	
jn	Not applicable (please explain briefly)]
4. Ii sea	is the orchard is in the Centra ason for chilling requirement	al Valley, did yo t?	ou monitor hou	rs during the dormant
jn	Yes	jn No		jா Orchard is not in the Central Valley

S	couting activities during the past year were primarily done by a:
í.	Licensed Pest Control Adviser
(6)	Farmer or farm staff
í.	Other non-PCA scout
(i)	Not applicable (please explain briefly)
D	uring bloom, flower clusters were examined for:
(f)	Pear psylla eggs and nymphs
(fi)	European red mites
(fi)	Pear rust mites
í.	Caterpillars (green fruitworm, obliquebanded leafroller)
(6)	Western flower thrips
	Mealybugs (grape, obscure)
	Western boxelder bug eggs and nymphs
(f)	None of the above
omi	ment:
P	heromone traps were placed in the orchard for codling moth and other
p	dopterous pests in March or as conditions became favorable.

4. Consperse stink bug is monitored in early April or as conditions become favorable.

jn	Yes	jn	No
jn	Not applicable (please explain briefly)		

2010 California Pear Sustainability Self-Assessment 5. Pheromone traps were checked at least weekly and counts recorded. m Yes in No Not applicable (please explain briefly) 6. Mating disruption for codling moth was used and pheromone dispensers were placed in the orchard at biofix. rn Yes in No Not applicable (please explain briefly) 7. Weather conditions are monitored in the spring for hours and temperature of wetting to forecast pear scab potential. jn Yes jn No Not applicable (please explain briefly) 8. If pear scab was treated, leaves and emerging fruit are checked for pear scab lesions after an infection period to assess the effectiveness of treatment. jn No Yes Not applicable (please explain briefly) 9. Weather conditions are monitored in the spring for degree hours and precipitation to forecast fire blight. rn Yes jn No Not applicable (please explain briefly) m

10. At least twice in the past year the orchard has been monitored for the following vertebrate pests:

- e Gophers
- E Ground Squirrels
- \in Voles at the base of young trees.
- None of the above.

Comment:

. F	rom petal fall to harvest,	scouting was done:	
'n	At least weekly	jn At least every two weeks	jn Less than every two weeks
m	Not applicable (please explain briefly)		
. F	From petal fall to harvest,	leaf samples were taken	and examined for:
ê	Pear psylla eggs and nymphs		
Ê	European red mites and eggs		
ê	Twospotted spider mites and predatory	/ mites	
ē	Pear sawfly and/or pear slug eggs and	larvae	
Ê	Aphids		
ê	Katydids or feeding damage		
ē	Pearleaf blister mite damage		
ê	None of the above		
om	nment:		
. F	rom petal to harvest, fru	it or shoots were sampled	l for:
ê	Pear rust mites at the calyx		
ē	Mealybugs (grape, obscure) at the caly	/X	
ē	Codling moth larva or damage		
Ê	Obliquebanded leafroller larva or dam	age	
Ê	Plant bug damage (boxelder, lygus, sti	nk)	
Ê	Katydid damage after June 30		

4. Degree days were monitored a traps are monitored throughout	and recorded for codling moth beginning wit the season through mid-September.	h biofix and
jn Yes	j: No	
jn Not applicable (please explain briefly)		
5. At 800 to 900 degree-days from	n biofix, fruit is monitored for damage.	
j Yes	jn No	
Not applicable (please explain briefly)		
6. Scouting included checking c	over crops and weeds for:	
e Plant bugs (lygus, stink, boxelder)		
∈ Katydid nymphs		
\in None of the above		
Comment:		
7. During rattail bloom weather c	onditions were monitored for fire blight.	
j Yes	jn No	
j∩ Not applicable (please explain briefly)		

7. Pest Management: Harvest activities

- 1. During harvest fruit was checked for feeding damage caused by:
 - $_{\ensuremath{\overleftarrow{\rm e}}}$ Codling moth
 - € Obliquebanded leafroller
 - Plant bugs (boxelder, lygus, stink)
 - E Katydids
 - e Mealybugs (grape, obscure)
 - e Pearleaf blister mite
 - e Pear rust mite
 - San Jose scale
 - Pear scab lesions (primary or secondary)
 - New or unusual damage or pests
 - None of the above
- Comment:

8. Pest Management: Post-harvest activities

1. Post harvest, top shoots were checked for:

- e Pear psylla nymphs and eggs
- e Webspinning spider mites
- European red mite
- e Pear rust mites
- \in Pearleaf blister mite damage on leaves
- e Pear sawfly and/or pear slug
- ∈ Pear scab lesions on leaves
- None of the above

Comment:

2. Fruit left on trees after harvest was sampled for coding moth and/or damage.

jn Yes

jn No

9. Pest Management: Orchard floor vegetation

1. Do you have an orchard floor vegetation management plan?

jn Yes

in No

Not applicable (please explain briefly)

2. If so, my management plan includes:

- e Pre-emergent herbicides
- e Post-emergent herbicides
- Non-herbicide techniques
- ∈ A seeded cover crop
- € Refuges planted or preserved for beneficial organisms and/or wildlife
- \in None of the above

Comment:

10. Pest Management: Pesticide application tools

1. Do you use a custom applicator for pesticides applications?

in Yes

in No

Not applicable (please explain briefly)

2. For commonly applied pesticides, the following data sources have been collected by the person responsible for application decisions:

E Impact on natural enemies – for example, information can be found in the UC IPM publication "Relative Toxicities of Insecticides and Miticides Used in Pears to Natural Enemies and Honey Bees" or on labels

e Potential for water quality problems – for example, by using the UC IPM WaterTox database or label information (see http://www.ipm.ucdavis.edu/TOX/simplewatertox.html)

E Impact on aquatic invertebrates - information can be found in UC ANR Publication 8161, "Pesticide Choice." (http://anrcatalog.ucdavis.edu/pdf/8161.pdf) or on some labels

e Availability of formulations other than emulsifiable concentrate (EC) formulations to reduce volatile organic compounds generated from pesticides

∈ None of the above

Comment:

3. For pesticides applied in the past year, the following data sources have been collected by the person responsible for application decisions:

E Chemical mode of action or resistance class

E Restricted entry intervals (REI) and preharvest intervals (PHI) of commonly used materials

e Potential for residue on crop at harvest or post-harvest, with restricted use of those with greatest residue potential

E Acute toxicity to mammals, and reduced use of the most toxic materials

E Chronic toxicity to mammals, and reduced use of the most toxic materials - sources of information include: MSDS, US EPA Carcinogencity rating, and/or CA Proposition 65 guidelines

None of the above

Comment:

4. Complete, legible pesticide application records are kept available and maintained for at least three years. Records include target pest, date, time, location, material applied, rate, applicator, application method, weather conditions, estimated or measured wind speed.

J	jn Yes	jn No	
jn	Not applicable (please explain briefly)		
5. A	. Are pesticide records reviewed for th	he following?:	
ê	E Pesticide use efficiency, e.g., lbs or dollars per unit of pro	oduction, was measured and recorded for the season	
ê	\in Any reductions realized through transitioning to reduced	risk or non-chemical strategies are documented	
ē	\in Performance of pesticides most at risk of resistance to de	etect and report problems early	
ê	\in Performance was evaluated through in-field check or cor	mparison blocks	
ê	\in Performance was evaluated through post-treatment pest	t counts in field	
ē	\in Performance was evaluated through laboratory testing o	of samples collected on site	
ê	\in None of the above		
Com	Comment:		
3. S	. Staff members most directly respons	sible for pest management have met the mini	num
con	ontinuing education requirements for	pesticide applicator licensing/certification.	
jm	jn Yes	jm No	
jn jn	jn Yes jn Not applicable (please explain briefly)	jn No	

requirements. Options include DPR continuing education events related to IPM, sustainable ag/IPM.

jn	Yes	jn	No
jn	Not applicable (please explain briefly)		

Yes	jn No	
Not applicable (please explain b	riefly)	
Does your operation n	naintain organized records on pesticide a	pplicator
ensing/certification for	r its applicators?	
n Yes	j- No	
Not applicable (please explain b	riefly)	
ococion Standard, rigi	it to know matchar and availability of pers	
uuinmant (DDE) far nac	ticidae usad?	
uipment (PPE) for pes	ticides used?	
Juipment (PPE) for pes	ticides used? j∩ [№]	
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Iuipment (PPE) for pes Yes Not applicable (please explain b In the past two years plations? Yes Not applicable (please explain b	ticides used? j∩ [№] , has your operation been cited for chemic j∩ [№]	cal application
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Iuipment (PPE) for pes Yes Not applicable (please explain b In the past two years plations? Yes Not applicable (please explain b	ticides used? if No nefly) f No riefly)	cal application

11. Resolving Citations

1. If yes, have all the citations been resolved or in the process of being resolved?

jn 1	/es
------	-----

jn No

12. Pest Management: Drift management plan

1. In the past year, your operation has written or updated a drift management plan containing the following information:

E The correct setup of the sprayer for the crop/pest being treated. (e.g., what rpm, speed, psi, etc. are needed to do the job while reducing drift potential? Which sprayers are appropriate for each job?)

∈ Recommended nozzles for each expected spraying situation

Recommended minimum/maximum pressures to reduce drift

E Setup of boom to maximize spray droplets hitting the target (e.g., what are the correct nozzle angles? How do you check them?)

Proper calibration of the sprayer. (e.g., what's an easy way to check the nozzles given your situation? What should the numbers be [to reduce calculation time in the field]? How frequently should you do it? Where do you keep calibration records?)

E Training references for the correct operation of the sprayer(s). (e.g., what references are available and where are they kept?)

E Spray additives that can reduce potential drift

∈ Information on maximum wind speed for spraying

E How to check for atmospheric inversion conditions

e What websites or other sources are available to tell you if you are in an inversion condition

E Instructions for when to turn off sprayer when making turns at the end of fields. (It is recommended that you give a range of distances based on weather conditions, especially when spraying near sensitive areas.)

E Location of buffer areas maintained around fields

E Location of sensitive areas such as houses, roads, waterways, and other crops (Sensitive areas can include rivers or canals, as well as schools and hospitals, etc.)

∈ None of the above

Comment:

2. In the past three years, has the operation been cited for off-target application of agrochemicals (i.e., drift)?

jn Yes

in No

13. Drift Citations

1. If so, have you documented the response internally?

jn Yes

jn No

In the nast year he	we you developed or undeted a written putri	iont management pla
i. In the past year, ha	ave you developed of updated a written nutri	ient management pla
jn res	Jîn No	
jn Not applicable (please exp	lain briefly)	
2. In the past year, ha	ive you taken or done tissue nutrient testing	j at least once to
jn Yes	jîn No	
jn Not applicable (please exp	lain briefly)	
3. Does your nutrient	management plan use previously recorded	nitrogen use efficier
ates (e.g., total N per	r acre) to forecast orchard nutrient needs?	-
Yes	in No	
jn Yes	jn No	
j∩ Yes j∩ Not applicable (please exp	jn No lain briefly)	
j∩ Yes j∩ Not applicable (please exp	jா No lain briefly)	
j∩ Yes j∩ Not applicable (please exp	jn No lain briefly) ere your application rates kept at or below u	niversity recommend
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⊧. N	lot applicable (please explain briefly)	5	
. Do	es your operation maintain re	cords pertaining to nutrient applications	?
in Y	′es	to No	
to N	lot applicable (please explain briefly)	5	
. Ha	ive you tested soil organic ma	tter in the last five years?	
jn Y	′es	jn No	
ito N	lot applicable (please explain briefly)		
	······································		
0. H	ave vou tested soil salinity lev	vels in the past five years?	
to Y	/es	to No	
jn N ∏	lot applicable (please explain briefly)		
1. A	re the row middles of your ord ned (i.e. discing of row middle	shard maintained in resident vegetation o	r cover ect
occa	sional problems)?		
	′es	j∵∩ No	
jn Y	lot applicable (please explain briefly)		
jn Y in N			
jn Y jn N			
jn Y jn N) the past two years, have you	added soil organic matter amendments (e.a.
jn ^v jn ∾ 2. Ir	ו the past two years, have you סost, mulch, or composted ma	added soil organic matter amendments (anure)?	e.g.
jn Y jn N 2. Ir comp tn Y	n the past two years, have you post, mulch, or composted ma	added soil organic matter amendments (anure)?	e.g.
jn ^v jn ℕ 2. Ir comp jn ^v	n the past two years, have you post, mulch, or composted ma ^{'es}	a added soil organic matter amendments (anure)? j∩ №	e.g.

13. The farm property outside of the orchard has no visible erosion, OR erosion potential is being reduced or corrected through one or more of the following techniques: windbreaks, terraces, cover crops, mulches, contours, managed drainage, buffer or filter strips, minimum tillage.

jn	Yes	jn	No
jn	Not applicable (please explain briefly)		

14. Orchard(s) has no visible erosion, OR erosion potential is being reduced or corrected through one or more of the following techniques: terraces, cover crops, mulches, contours, managed drainage, buffer or filter strips, minimum tillage.

jm	Yes	jm	No
j'n	Not applicable (please explain briefly)		

15. How many lbs of macro nutrients did you apply to this orchard for 2010?

(*NOTE: please use actual P and actual K instead of P2O5 or K2O.)

Lbs. N per acre:	
Lbs. P per acre*:	
Lbs. K per acre*:	

15. Water Management

1. In the past year, have orchard(s)?	ou written or updated a water management plan for your	
jn Yes	j∵∩ No	
j∩ Not applicable (please explain b	ofly)	
2. In the past year, did ye to your orchard(s)?	ı track and record information on irrigation applications m	ade

jn	Yes	j'n	No
jn	Not applicable (please explain briefly)		

3. What percentage of your operation is on the following irrigation system types?

Drip irrigation	
Micro Sprinkers	
Micro Oprinkers	
Sprinklers	
Flood of Furrow	

4. If your operation uses flood/ furrow irrigation, was the orchard(s) laser leveled prior to planting?

Piai		
jn	Yes	j: No
jn	Not applicable (please explain briefly)	
5. D	o you use soil moisture mor	nitoring devices?
jn	Yes	jn No
jn	Not applicable (please explain briefly)	
6. D	o you use an evapotranspir	ation (ET) model to schedule
jn	Yes	j: No
jn	Not applicable (please explain briefly)	

es in No of applicable (please explain briefly) es in No of applicable (please explain briefly)		jn No	
the past five years, have you sampled well water used for irrigation for nutrie EC? es jn No ot applicable (please explain briefly) the past year, has your irrigation water been tested for bacterial levels? es jn No ot applicable (please explain briefly) ooes your operation irrigate with "gray" water (treated water from sewage fac igation water? es jn No ot applicable (please explain briefly) ave you done a pump efficiency test in the past five years? es jn No ot applicable (please explain briefly) ere flow meters installed on at least some of your pumps? as jn No	ot applicable (please explain briefly)		
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or applicable (please explain briefly) oes your operation irrigate with "gray" water (treated water from sewage factigation water? es jn No ot applicable (please explain briefly) ave you done a pump efficiency test in the past five years? es jn No ot applicable (please explain briefly) re flow meters installed on at least some of your pumps? es jn No ot applicable (please explain briefly)	es		
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	ave you done a pump efficiency es ot applicable (please explain briefly) re flow meters installed on at le es ot applicable (please explain briefly)	test in the past five years? jn ∾ ast some of your pumps? jn ∾	

16. Recording Water Volume

1. If so, did you record your water volume usage?

jn Yes

jn No

17. Water Applied

1. How many acre inches of water did you APPLY as irrigation to this orchard for 2010?

Acre inches per acre:

18. Ecosystem Management

1. H the	ave you converted any environmentally s past three years?	ensitive areas t	o pear production within
jn	Yes	jn No	
jn	Not applicable (please explain briefly)		

2. Do you have a current map of your orchard(s) identifying environmentally sensitive areas? (Sensitive areas are those areas on or around your farm that are either potential sources of hazards or susceptible to environmental damage, such as surface water bodies, wetlands, wellheads, endangered/threatened species habitat, chemical storage sites, drainage areas, fuel tanks, or dwellings.)

jn	Yes	jn No		
jn	Not applicable (please explain briefly)		_	
3. D	oes your map delineate buffer zones arou	und sensitive ar	ireas?	
jn	Yes	jn No		
jn	Not applicable (please explain briefly)		_	
4. A	re sensitive areas marked by signs or fen	ced off to preve	ent activities which might	
neg	atively impact these areas?			

J : 1		JU NO	
jn Not applicat	le (please explain briefly)		_

5. Are filter strips established around riparian or drainage areas of your property(ies)?

jn Yes

in No

Not applicable (please explain briefly) a portion of your property maintained i (es Not applicable (please explain briefly) the past 12 months have you visually r	n an undeveloped state? j∩ [№]	
a portion of your property maintained i ^{(es} Not applicable (please explain briefly) the past 12 months have you visually r	n an undeveloped state? j∩ [№]	
a portion of your property maintained i ^{(es} Not applicable (please explain briefly) the past 12 months have you visually r	n an undeveloped state? j∩ [№]	
Yes Not applicable (please explain briefly) the past 12 months have you visually r	jn No	
Not applicable (please explain briefly) the past 12 months have you visually r	nonitored sensitive greas in your or	
the past 12 months have you visually r	nonitored sensitive greas in your or	
the past 12 months have you visually r	nonitored sensitive areas in your or	
Not applicable (please explain briefly)) : I	
Voc		
Not applicable (please explain briefly)		
e pesticides stored on the farm in a loc	ked containment area?	
Not applicable (please explain briefly)	-	
re pesticides stored within a secondar	y containment device or structure (а
	ill pallet, placed around the pesticic	les to
ainer or structural barrier, such as a sp		
ainer or structural barrier, such as a sp ain the contents in the events of a spill	or leak)?	
ainer or structural barrier, such as a sp ain the contents in the events of a spill ′es	or leak)? j∩ [№]	
ainer or structural barrier, such as a sp ain the contents in the events of a spill ^{/es} lot applicable (please explain briefly)	or leak)? j∩ №	
ainer or structural barrier, such as a sp ain the contents in the events of a spill (es Not applicable (please explain briefly)	or leak)? jn №	
ainer or structural barrier, such as a sp ain the contents in the events of a spill (es Not applicable (please explain briefly)	or leak)? j∩ №	
ainer or structural barrier, such as a sp ain the contents in the events of a spill ^{res} Not applicable (please explain briefly)	or leak)? jn №	
ainor or structural barrier such as a sp	in paner, placed around the pe	Sticiu

11. Is a spill response/cleanup kit in the pesticide storage facility? [A spill response can
include safety clothing, absorbent materials, etc. for cleaning up spills safely. They can
be purchased online (e.g., www.grainger.com; www.gemplers.com) or through a local
farm supplier.]

Yes jn No
Not applicable (please explain briefly)
Do you have a written environmental emergency plan addressing the following
ues?:
Who to contact if there is a fire or a nutrient, pesticide or fuel spill, with phone numbers and posted appropriately
How to contain the spill
How to clean up the spill
Names of key staff responsible for emergency responses
How to prevent worker exposure in event of a spill or file
How to prevent spills (specific to the farm)
A copy of your map of sensitive areas
How often the plan will be updated and training procedures for staff
None of the above
iment:

13. Have you experienced an environmental emergency in your orchard operations within the past three years?

jn Yes

jn No

19. Employer Practices

1. Do you have employees in your orchard operations? jn Yes jn No jn Not applicable (please explain briefly)

20. Employee Practices & Safety

1. From the list below, which employee policies or practices do you have for your operations?:

- ∈ A written policy providing education resources and/or cost share
- Provide education leave
- € Provide in-house education and training such as safety training or pest management training.
- € A written policy providing rewards/incentives to employees for innovation and improvement
- e Provide employee profit sharing
- Provide performance incentives
- Provide safety incentives
- e Provide housing for labor
- Provide transportation to labor
- e A written policy for internal advancement vs. external hiring
- Provide retirement benefits
- Provide insurance opportunities
- e Provide vacation
- Provide sick leave
- e Provide paid holidays
- None of the above

Comment:

2. Does your operation maintain organized legal documentation pertaining to employee health and safety?

in No

Jn	Yes
jn	Not applicable (please explain briefly)

21. Air Quality

Yes	j:n No	
Not applicable (please explain briefly		
vehicle access to unpaved r	oads physically restricted?	
Yes	jn No	
Not applicable (please explain briefly)		
Yes	jn No	
Yes Not applicable (please explain briefly)	jn No	
Yes Not applicable (please explain briefly) Ye at least some farm roads a	j∩ № nd/or equipment yards paved or main	ntained in
Yes Not applicable (please explain briefly) re at least some farm roads a etative cover. Yes	jn № nd/or equipment yards paved or main jn №	ntained in
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n Yes	jn No	
Not applicable (please explain briefly)		
Is engine maintenance done	on a regular basis?	
Yes	j:n No	
Not applicable (please explain briefly)		
Are low-emission vehicles (e	.g., flex fuel, hybrids, biodiesel) used b	by your farming
Yes	to No	
1	J:1	
 Not applicable (please explain briefly) Have engine emissions been or IV standards? 	en reduced by retrofitting/replacing die	sel engines to Ti
 Not applicable (please explain briefly) Have engine emissions been or IV standards? Yes 	en reduced by retrofitting/replacing die jn_№	sel engines to Ti
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2010 California Pear Sustainability Self-Assessment 13. Is irrigation generally done during off-peak hours when ozone formation and water evaporation are lower? in No in Yes Not applicable (please explain briefly) 14. Does the irrigation system for this orchard have no emissions (e.g., solar-powered pumping system, gravity-fed flood/furrow system)? in Yes In No Not applicable (please explain briefly) 15. Is extra effort made to reduce VOCs during the peak ozone period (May 1 to October 31) by avoiding use of emulsifiable concentrates and fumigants and considering lowrate spray technologies? jn Yes jn No Not applicable (please explain briefly) 16. Are precision sprayers (e.g., low-volume sprayers, "smart sprayers" with remote sensors) used to reduce pesticide use and increase on-target deposition? jn Yes jn No Not applicable (please explain briefly)

22

Yes	j∵∩ No
Not applicable	(please explain briefly)
How do you at is the bes	I track and record electricity use in your farming operation (select the or t fit)?
I don't have any	<i>i</i> idea how much electricity is used.
l just file paid b	ills.
Electricity use is	s recorded and tracked for the operation as a whole.
Electricity use is	s recorded and tracked by specific orchard(s) or facility.
Electricity use is	s calculated and tracked per acre
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Electricity use is other (please sp	s calculated and tracked per acre
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Electricity use is other (please sp If you recor per acre	d and track annual electricity use per acre, what is that amount for 2010
Electricity use is other (please sp in the specific speci	a calculated and tracked per acre
Electricity use is other (please sp If you recor per acre ars per acre How do you	a calculated and tracked per acre becify) d and track annual electricity use per acre, what is that amount for 2010 u track and record fuel use in your farming operation (select the one that
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Electricity use is other (please sp in you recor per acre ars per acre How do you best fit)?	s calculated and tracked per acre becify) d and track annual electricity use per acre, what is that amount for 2010 u track and record fuel use in your farming operation (select the one that y idea how much fuel is used.
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Fuel type:		
Amount (gal per acre):		
Fuel type:		
Amount (gal per acre):		
Fuel type:		
Amount (gal per acre):		
Fuel type:		
Amount (gal per acre):		

efficiency?

jn	Yes	jn No
jm	Not applicable (please explain briefly)	

7. In the past 5 years, have you developed an energy management plan and budget for short and long term (e.g., 1, 3 and 5 year) improvements?

jn	Yes	jn	No
jn	Not applicable (please explain briefly)		

8. Are tire pressures for tractors and other vehicles checked regularly throughout the year to ensure proper inflation?

jn	Yes	jn No
jn	Not applicable (please explain briefly)	

9. Are tractors and other vehicles serviced and maintained regularly throughout the year, including timely replacement of oil, fuel, and air filters?

jn Yes	j:n No
jn Not applicable (please explain briefly)	

10. Are lighter vehicles used for road trips that do not require a large vehicle (e.g., small pick-up instead of a large pick-up, car instead of a pick-up, etc.)?

jn	Yes	jn	No
jn	Not applicable (please explain briefly)		

11. Are ATVs, bicycles, motorcycles, golf carts, self-propelled light spray rigs, or other small-engine vehicles used instead of tractors for on-farm transportation and for jobs requiring less horsepower?

jn	Yes	j n	No
jn	Not applicable (please explain briefly)		

12. Are purchases of tractors or other motorized equipment based on calculated horsepower needs and fuel efficiency?

j m	Yes	j m	No
jn	Not applicable (please explain briefly)		

13. Have you painted/coated above ground fuel storage tanks white or aluminum to reflect solar radiation (note that some air districts have restrictions on the type of paint which may be used).

jm	Yes	jm	No
jn	Not applicable (please explain briefly)		

14. Are above ground fuel storage tanks shaded (if allowed under local regulations)?

jn Yes

in No
2010 California Pear Sustainability Self-Assessment 15. Do above ground fuel storage tanks use pressure-relief vacuum caps rather than conventional caps (if allowed under local regulations)? in No m Yes Not applicable (please explain briefly) 16. Are most or all of your shop/plant and yard lighting options more efficient than incandescent bulbs (e.g., Energy Star certified, compact fluorescent, LED, HID, T5 or T8 fluorescent bulbs or electronic instead of magnetic ballasts)? jn Yes In No Not applicable (please explain briefly) b) 17. Is your shop lighting designed with task or area lighting to allow work without lighting unused spaces? jn Yes jn No Not applicable (please explain briefly) 18. Do motion sensors or timers control your yard and/or shop lights? jn No m Yes Not applicable (please explain briefly) 19. Is your shop lighting augmented with natural light from skylights or windows to reduce the need for electrical lighting during the day? in Yes in No Not applicable (please explain briefly) 'n. 20. Are your irrigation pump motors or engines maintained regularly? in Yes in No Not applicable (please explain briefly)

2010 California Pear Sustainability Self-Assessment 21. Has your irrigation pumping system been tested for energy efficiency within the last three years (and repairs or improvements made if appropriate)? in Yes in No Not applicable (please explain briefly) 22. Is your irrigation pumping done during off-peak hours whenever possible (for electric pumps)? rn Yes in No Not applicable (please explain briefly) 23. Are variable speed drives installed on pumps which have variable loads (for electric pumps)? jn No Yes Not applicable (please explain briefly) 24. Is solar energy used to generate electricity for your operation? n Yes In No Not applicable (please explain briefly) 25. Is wind power used/generated by your operation? in Yes in No Not applicable (please explain briefly) 26. Does your operation have a contract with your electrical utility to purchase energy from renewable sources (e.g., PG&E ClimateSmartTM program, or SMUD Greenenergy® program)? in No in Yes Control Other (please specify)