California Almond Sustainability Program
Self-Assessment Answer Sheet

Assessed By_____ **Orchard/Block**_____ **Date** _____

	Practice or Metric	Your Selection
	Air Quality Module	
	INTRODUCTION AND GENERAL INFORMATION - AIR QUALITY	
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	ORCHARD FLOOR MANAGEMENT - REDUCING PARTICULATES AND ENHANCING CARBON SEQUESTRATION	
01	Orchard floor management techniques were used to reduce tractor passes and associated energy use (e.g., judicious use of preemergent herbicides to reduce the passes needed for weed management).	◯ Yes ◯ No ◯ Not applicable
02	A plan was implemented to minimize passes by equipment and motorized vehicles in the orchard.	◯ Yes ◯ No ◯ Not applicable
03	Organic soil amendments (e.g., compost) were used to stabilize soil by increasing moisture retention and reducing compaction.	◯ Yes ◯ No ◯ Not applicable
04	Cover crop (resident ground cover or planted) was intentionally grown between orchard rows. ***If No, then click 'No' and skip to question 7***	◯ Yes ◯ No
	05. The ground cover was a planted cover crop. ***If No, then click 'No' and skip to question 7.***	◯ Yes ◯ No
	06. The cover crop was selected to stabilize and improve soil (e.g., adding organic matter, water infiltration or managing soil moisture).	◯ Yes ◯ No
07	Natural habitat has been maintained and/or perennial vegetation (hedgerows or trees) has been planted or retained in unfarmed areas within or surrounding the orchard. (Planting and maintaining can also benefit pollinators and provide other ecosystem services.)	◯ Yes ◯ No ◯ Not applicable
	UNPAVED SURFACES - REDUCING PARTICULATES	
08	Unpaved roads had speed limits of 15 mph or less posted to reduce dust generation.	◯ Yes ◯ No ◯ Not applicable
09	Vehicle access to unpaved roads was restricted physically (e.g., by a gate).	◯ Yes ◯ No ◯ Not applicable
10	Applications of water or organic dust suppressants (e.g., road oil or polymers) or layering of mulches, chips (during winter), sand or gravel was used on unpaved roads and/or on unpaved equipment yards.	◯ Yes ◯ No ◯ Not applicable
	HARVEST - REDUCING PARTICULATES	
11	Year-round floor management resulted in a smooth, level and clean orchard floor at harvest, to help optimize harvest efficiency and minimize dust.	◯ Yes ◯ No
12	For this orchard, who was primarily responsible for harvest equipment and carrying out harvest activities?	◯ Owner/staff ◯ Custom harvest contractor ◯ Both owner/staff and custom harvest contractor

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13	A harvest dust management plan was implemented that ensured operators of sweepers and pickup machines (including custom harvesters) and others involved in harvest activities were appropriately trained before harvest.	◯ Yes ◯ No
14	How many sweeper blower passes were used?	◯ 0 (sweeper not used) ◯ 1 ◯ 2 ◯ 3 or more
15	Sweeper and pickup machine passes and travel direction directed dust into tree canopies (filter mechanism) and away from roads, homes and other sensitive locations such as schools, hospitals and day care centers.	◯ Yes ◯ No ◯ Not applicable
16	Was the orchard adjacent to a public road(s)? ***If No, then click 'No' and skip to question 19.***	◯ Yes ◯ No
	17. Traffic signs warning of low visibility were posted along the roads during sweeping and pickup activities.	◯ Yes ◯ No
	18. Sweeping and pickup activities occurred when road traffic was at a minimum.	◯ Yes ◯ No
19	To reduce dust, the sweeper head was set at the manufacturer-recommended height (not lower).	◯ Yes ◯ No ◯ Not applicable
20	The sweeper head used wire tines only (no rubber or plastic).	◯ Yes ◯ No ◯ Not applicable
21	The angle of the sweeper blower spout and speed of the fan were adjusted to match orchard conditions so only nuts were moved and not soil.	◯ Yes ◯ No ◯ Not applicable
22	Harvest sweepers designed to minimize passes and reduce dust were used (e.g., sweepers with a mounted berm brush).	◯ Yes ◯ No ◯ Not applicable
23	Groundspeed for conventional pickup machines was lowered to match local conditions (e.g., 1.5 mph instead of 3 mph).	◯ Yes ◯ No ◯ Not applicable
24	Separator fan speed for conventional pickup machines was lowered to match local conditions (e.g., 910 instead of 1,080 rpm fan speed).	◯ Yes ◯ No ◯ Not applicable
25	Was a conditioner used prior to using a harvester for pickup? ***If No, then click 'No' and skip to question 29.***	◯ Yes ◯ No
	26. How many conditioner passes per row were done?	◯ 1 ◯ 2 ◯ 3 or more
	27. What type of conditioner was used?	◯ Conventional ◯ Low-dust
	28. Please specify the approximate percent (%) of acreage that was conditioned.	◯ None (0%) ◯ 1-25% ◯ 26-50% ◯ 51-75% ◯ 76-99% ◯ All (100%)
29	Dust was reduced by setting head heights for pickup machines to optimum levels based on local conditions (not too low).	◯ Yes ◯ No ◯ Not applicable
30	Was at least one type of low-dust harvester used?	◯ Yes

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	If No, then click 'No' and skip to question 33.	◯ No
	31. Which type(s) of low-dust harvester(s) were used? ***Answer 'yes' to all that apply.***	
	31.01. Pull-behind PTO or self-propelled low-dust harvester.	◯ Yes ◯ No
	31.02. Low-dust retrofit technology for harvester (e.g., cyclone separator).	◯ Yes ◯ No
	31.03. Off-ground harvester (off-floor harvesting). ***If No, then click 'No', and skip to question 33.***	◯ Yes ◯ No
32	If nuts were harvested using off-ground harvesting equipment, please select the scenario that best describes the overall harvesting practice:	
	32.01. Off-ground equipment was used to reallocate the nuts directly to the windrow, followed by a low dust or conventional harvester (avoiding use of a sweeper and/or conditioner).	◯ Yes ◯ No
	32.02. Nuts were naturally dried on-ground outside of the orchard with pick-up using a standard harvester.	◯ Yes ◯ No
	32.03. Nuts never touched the ground prior to arriving at the processing facility, and nuts were mechanically dried.	◯ Yes ◯ No
	COMBUSTION (FUEL AND WOOD) AND ALTERNATIVES - REDUCING PARTICULATES, OZONE PRECURSORS AND GREENHOUSE GASES	
33	Prunings were not burned, but were used productively (e.g., chipped or composted and used on-site, used for energy generation or used on unpaved roads).	◯ Yes ◯ No ◯ Not applicable
34	Vehicles, excluding farm equipment, using low-emission technology or low-emission fuels (e.g., flex fuel, hybrids or biodiesel) were used by the business.	◯ Yes ◯ No ◯ Not applicable
35	Selection of stationary power equipment was based, in part, on emissions ratings (e.g., electric motors instead of diesel engines for pumping systems).	◯ Yes ◯ No ◯ Not applicable
36	Engine emissions have been reduced by retrofitting/replacing diesel engines to Tier 3 or 4 standards.	◯ Yes ◯ No ◯ Not applicable
37	Diesel engines have been replaced (or retrofitted) with technology relying on cleaner-burning fuel (e.g., propane, natural gas or biodiesel) or electricity.	◯ Yes ◯ No ◯ Not applicable
38	On-site renewable energy sources (e.g., solar, wind, biogas digester or fuel cells) supplied at least some electricity or heat requirements. ***If No, then click 'No' and skip to question 42.***	◯ Yes ◯ No
	39. On-site solar energy was used to generate electricity or heat (e.g., hot water or processing heat).	◯ Yes ◯ No
	40. On-site wind power was used to generate electricity.	◯ Yes ◯ No
	41. An on-site biogas digester(s) or fuel cell(s) was used to generate electricity or heat.	◯ Yes ◯ No
42	The operation contracted with its electrical utility to receive more than the standard blend of the electricity requirement from renewable sources, e.g., PG&E Solar Choice (TM) or SMUD Greenergy (R) programs.	◯ Yes ◯ No ◯ Not applicable
	IRRIGATION PUMPS - REDUCING PARTICULATES, OZONE PRECURSORS AND GREENHOUSE GASES	
43	A pump(s) was used for irrigation for the orchard/facility being assessed.	◯ Yes

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	If No, then click 'No' and skip to question 49.	◯ No
	44. One or more pumps was powered by an electric motor. ***If No, then click 'No' and skip to question 46.***	◯ Yes ◯ No
	45. Variable-speed drives have been installed for electric pumps experiencing variable loads.	◯ Yes ◯ No ◯ Not applicable
	46. The irrigation pumping system was tested for energy efficiency within the last three years, and repairs or improvements were made where needed.	◯ Yes ◯ No
	47. Irrigation pumping was done during off-peak hours whenever possible to reduce demand on the energy grid (for electric pumps), and when ozone formation and water evaporation are lower.	◯ Yes ◯ No
	48. The irrigation system was computer controlled (e.g., by a SCADA system) to allow users to monitor flow rates and/or other efficiency data about the system.	◯ Yes ◯ No
IRRIGATION EFFICIENCY - REDUCING PARTICULATES, OZONE PRECURSORS AND GREENHOUSE GASES		
49	Water applied was measured and recorded for the entire season.	◯ Yes ◯ No
50	Irrigation system infrastructure (e.g., pumps, lines, filters and emitters) was regularly tested and, if necessary, corrected to maintain optimal efficiency.	◯ Yes ◯ No ◯ Not applicable
51	Irrigation-scheduling technologies were used to decide when and how much to irrigate based on tree need and soil/climate conditions.	◯ Yes ◯ No ◯ Not applicable
52	Water requirements were based on almond orchard evapotranspiration (ETc). ***If No, then click 'No' and skip to question 54.***	◯ Yes ◯ No
	53. Weekly water requirements were based on historical (normal year) regional ETc and were adjusted for actual ETc from the previous week.	◯ Yes ◯ No
54	Strategic Deficit Irrigation (SDI) was used throughout the hullsplit interval to provide a uniform hullsplit, increase drying on the tree, and facilitate a rapid, timely harvest.	◯ Yes ◯ No
PEST MANAGEMENT AND SPRAY OPERATIONS - REDUCING PARTICULATES, OZONE PRECURSORS AND GREENHOUSE GASES		
55	Integrated pest management (IPM) techniques were used to reduce the likelihood of treatments for insect, disease and weed control and associated energy use.	◯ Yes ◯ No
56	When choosing pesticides, low-VOC formulations (e.g., not emulsifiable concentrates) were used when available and practical for application.	◯ Yes ◯ No ◯ Not applicable
57	Was this orchard planted by the current farm owners or managers? ***If No, then click 'No' and skip to question 61.***	◯ Yes ◯ No
	58. Was the site fumigated before planting? ***If No, then click 'No' and skip to question 61.***	◯ Yes ◯ No
	59. Was a totally impermeable film (TIF) tarp used for the fumigation?	◯ Yes ◯ No
	60. The fumigant(s) was applied before or after the peak ozone interval, from May 1 to Oct. 31.	◯ Yes ◯ No ◯ Not applicable
FERTILIZATION - REDUCING GREENHOUSE GASES		
61	Applied amounts of nitrogen fertilizer were calculated from yield estimates, nitrogen credits from other sources (e.g., irrigation water, compost and/or cover crops) , and results of early season leaf sampling. ***If No, then click 'No' and skip to question 63.***	◯ Yes ◯ No

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	62. Was the Almond Board's online Nitrogen Calculator used to determine these nitrogen fertilizer amounts? ***ABC Nitrogen Calculator can be accessed at www.SustainableAlmondGrowing.org***	◯ Yes ◯ No
63	How many soil or fertigation applications of fertilizer nitrogen (including post-harvest) were made during the year?	◯ 1 application ◯ 2 applications ◯ 3 applications ◯ 4 applications ◯ 5 or more applications
64	Tissue testing and other nutrient budgeting techniques (e.g., estimates of yield and nutritional needs for tree growth) were used to efficiently utilize fertilizers. (Efficient fertilizer use limits the energy footprint associated with fertilizer use, manufacture, application and transport.)	◯ Yes ◯ No
65	Fertilizer-efficient and irrigation-efficient practices were used together to maintain desired nitrogen in the root zone, and reduce losses from N2O emissions, nitrate leaching or runoff.	◯ Yes ◯ No ◯ Not applicable
66	Were plant tissues sampled and tested for nutrient content to guide the amounts of fertilizer applications? ***If No, then click 'No' and skip to question 70.***	◯ Yes ◯ No
	67. Were multiple tissue samples taken within a single managed unit (generally an orchard or block)? ***If No, then click 'No' and skip to question 70.***	◯ Yes ◯ No
	68. Test results of tissue tests were mapped to show variation across the managed unit. ***If No, then click 'No' and skip to question 70.***	◯ Yes ◯ No
	69. Mapped results were used with precision application technology (variable rate technology) to apply different rates of fertilizer within the orchard.	◯ Yes ◯ No ◯ Not applicable
70	To ensure overall nitrogen use efficiency, a documented comprehensive nitrogen management plan and budget for this orchard was used.	◯ Yes ◯ No
	ORCHARD REMOVAL - FATE OF REMOVED TREES	
71	Was any acreage on this orchard removed and/or replanted in the past year? ***If No, then click 'No' and skip all parts of question 72.***	◯ Yes ◯ No
72	Of acreage removed and/or replanted in the last year, please specify the approximate number of acres of the almond orchard/trees by category:	
	72.01. Chipped and incorporated into the soil onsite (i.e., whole-orchard recycling).	
	72.02. Chipped and used as mulch to existing orchard ground, or layer to surfaces such as unpaved roads.	
	72.03. Used for energy generation.	
	72.04. Burned in the field.	
	72.05. Other, Please specify:	

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