

## California Almond Sustainability Program Self-Assessment Answer Sheet



Assessed By \_\_\_\_\_ Orchard/Block \_\_\_\_\_ Date \_\_\_\_\_

Practice or Metric		Your Selection
<b>Nutrient and Soil Management Module</b>		
<b>INTRODUCTION AND GENERAL INFORMATION - NUTRIENT MANAGEMENT</b>		
<b>METRICS</b>		
01	How many units (pounds per acre) of nitrogen (N) sourced from commercial fertilizer (mineral and organic) were applied to this orchard during the past season? (NOTE: The N of N-P-K on fertilizer labels shows the percent of N by weight.)	
02	How many pounds per acre of P205 (the phosphorous component) sourced from commercial fertilizer (mineral and organic) were applied to this orchard during the past season? (NOTE: The P of N-P-K on fertilizer labels shows the percent of P205 by weight.)	
03	How many pounds per acre of K2O (the potassium component) sourced from commercial fertilizer (mineral and organic) were applied to this orchard during the past season? (NOTE: The K of N-P-K on fertilizer labels shows the percent of K2O by weight.)	
04	Has the percent soil organic matter for this orchard been measured in the past 5 years? <i>If No, then click 'No' and skip to question 5.</i>	<input type="radio"/> Yes <input type="radio"/> No
	04.01. What was the measured percent soil organic matter?	
<b>SOURCE</b>		
05	Were the following sources of nitrogen utilized in this orchard in the past year? (Answer 'Yes' to all that apply)	
	05.01. commercial in-organic nitrogen fertilizer	<input type="radio"/> Yes <input type="radio"/> No
	05.02. commercial organic nitrogen fertilizer	<input type="radio"/> Yes <input type="radio"/> No
	05.03. manure (not recommended for food safety reasons)	<input type="radio"/> Yes <input type="radio"/> No
	05.04. compost	<input type="radio"/> Yes <input type="radio"/> No
	05.05. nitrogen-fixing cover crops	<input type="radio"/> Yes <input type="radio"/> No
06	Nitrogen contributions from compost, manure, or nitrogen-fixing cover crops were included in total nitrogen budgeting. <i>If compost, manure, or nitrogen-fixing cover crops were not used, then click 'Not applicable.'</i>	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
07	Was well water used for irrigation? <i>If No, then click 'No' and skip to question 10.</i>	<input type="radio"/> Yes <input type="radio"/> No
	08. Has the nitrogen content of the well water been tested at least once during the past 3 years? <i>If No, then click 'No' and skip to question 10.</i>	<input type="radio"/> Yes <input type="radio"/> No
	09. If the test indicated the water had nitrogen, the amount of nitrogen applied via irrigation over the season was calculated and used in calculating the total nitrogen applied. <i>If well water contained no nitrogen, then click not applicable.</i>	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable

AMOUNT		
10	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.)	<input type="radio"/> Yes <input type="radio"/> No
11	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. <b>If No, then click 'No' and skip to question 13.</b>	<input type="radio"/> Yes <input type="radio"/> No
	12. Was the Almond Board's online Nitrogen Calculator used to determine these nitrogen fertilizer amounts? <b>ABC Nitrogen Calculator can be accessed at <a href="http://www.SustainableAlmondGrowing.org">www.SustainableAlmondGrowing.org</a></b>	<input type="radio"/> Yes <input type="radio"/> No
13	Were plant tissues sampled and tested for nutrient content to guide the amounts of fertilizer applications? <b>If No, then click 'No' and skip to question 21.</b>	<input type="radio"/> Yes <input type="radio"/> No
	14. Tissue samples were collected following recommended procedures that included taking samples at the appropriate time(s) of year.	<input type="radio"/> Yes <input type="radio"/> No
	15. The methods used for tissue sampling ensured that the samples accounted for variations in soil characteristics, tree growth and other factors.	<input type="radio"/> Yes <input type="radio"/> No
	16. The tissues analysis included comparison to critical levels or expert recommendations.	<input type="radio"/> Yes <input type="radio"/> No
	17. Were multiple tissue samples taken within a single managed unit (generally an orchard or block)? <b>If No, then click 'No' and skip to question 20.</b>	<input type="radio"/> Yes <input type="radio"/> No
	18. Test results of tissue tests were mapped to show variation across the managed unit. <b>If No, then click 'No' and skip to question 20.</b>	<input type="radio"/> Yes <input type="radio"/> No
	19. Mapped results were used with precision application technology (variable rate technology) to apply different rates of fertilizer within the orchard.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
	20. Test results were kept from year to year to support future decision making in nutrient management.	<input type="radio"/> Yes <input type="radio"/> No
21	Has the soil been sampled and tested to identify any problems impacting nutrient availability or to guide management decisions? <b>If No, then click 'No' and skip to question 26.</b>	<input type="radio"/> Yes <input type="radio"/> No
	22. Soil samples were collected following recommended procedures.	<input type="radio"/> Yes <input type="radio"/> No
	23. The methods used for soil sampling ensured that the samples accounted for variations in soil texture and other orchard features.	<input type="radio"/> Yes <input type="radio"/> No
	24. Were multiple soil samples taken within a single managed unit (generally an orchard or block)? <b>If No, then click 'No' and skip to question 26.</b>	<input type="radio"/> Yes <input type="radio"/> No
	25. Results of soil tests were mapped to show variations and potential management zones within the orchard.	<input type="radio"/> Yes <input type="radio"/> No
26	Soil pH has been measured at least once in the past 3 years. <b>If No, then click 'No' and skip to question 28.</b>	<input type="radio"/> Yes <input type="radio"/> No
	27. Based on this measurement, soil amendments or other inputs (e.g., irrigation acid injection) for adjusting pH have been applied as needed to benefit nutrient availability. <b>If not measured or adjustments to pH were not needed, then click 'Not applicable.'</b>	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
TIMING		
28	All applications of fertilizers were made at recommended timings (coinciding with crop growth and demand).	<input type="radio"/> Yes <input type="radio"/> No
29	Was commercial fertilizer nitrogen applied to the orchard during the year using the following	<input type="radio"/> Yes

	methods? <b>If No, then click 'No' and skip to question 30.</b>	<input type="radio"/> No
	29.01. Nitrogen was applied broadcast	<input type="radio"/> Yes <input type="radio"/> No
	29.02. Nitrogen was fertigated	<input type="radio"/> Yes <input type="radio"/> No
	29.03. How many soil or fertigation applications of fertilizer nitrogen (including post-harvest) were made during the year?	<input type="radio"/> 1 application <input type="radio"/> 2 applications <input type="radio"/> 3 applications <input type="radio"/> 4 applications <input type="radio"/> 5 or more applications
<b>PLACEMENT</b>		
<b>30</b>	Which of the following practices were used to place fertilizer nitrogen in the root zone and/or minimize nitrogen leaching or runoff? (Answer 'Yes' to all that apply)	
	30.01. The depth of irrigation was monitored to ensure the nitrogen was positioned only in the root zone.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
	30.02. Irrigation-scheduling technologies were used to decide when and how much to irrigate based on tree need and soil/climate conditions.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
	30.03. Water requirements were based on almond orchard evapotranspiration (ETc). <b>If No, then click 'No' and skip to question 30.05.</b>	<input type="radio"/> Yes <input type="radio"/> No
	30.04. Weekly water requirements were based on historical (normal year) regional ETc and were adjusted for actual ETc from the previous week.	<input type="radio"/> Yes <input type="radio"/> No
	30.05. Does the orchard have a history of problems with water penetration (infiltration)? <b>If No, then click 'No' and skip questions 30.06 - 30.07.</b>	<input type="radio"/> No <input type="radio"/> Yes
	30.06. Gypsum, sulfuric acid, or other chemical additives, such as organic polyacrylamides (PAM) and polysaccharides or surfactants, was applied to the soil or in irrigation water to improve water penetration.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
	30.07. Because the soil surface seals, tillage was used to enhance water penetration.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
	30.08. 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.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
	30.09. Additions of soil organic matter were made or a cover crop was grown, or vegetative filter strips were used.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
	30.10. 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.)	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
<b>NITROGEN MANAGEMENT PLAN AND BUDGET</b>		
<b>31</b>	To ensure overall nitrogen use efficiency, a documented comprehensive nitrogen management plan and budget for this orchard was used.	<input type="radio"/> Yes <input type="radio"/> No
<b>FERTIGATION</b>		
<b>32</b>	Was fertigation used to provide any nutrients to the orchard during the year being assessed? <b>If No, then click 'No' and skip to question 36.</b>	<input type="radio"/> Yes <input type="radio"/> No
	33. The injection time for fertilizers was determined to ensure their proper placement in the root zone and prevent leaching. (Prior to initiating injection, the system was at the proper pressure.)	<input type="radio"/> Yes <input type="radio"/> No

	34. The injection time for system cleaning solutions was determined and used to ensure to ensure effective cleaning and rinsing.	<input type="radio"/> Yes <input type="radio"/> No
	35. At least one back flow prevention device was installed between the water source and the injection site. (County regulations vary - some require more than one device.)	<input type="radio"/> Yes <input type="radio"/> No
<b>ENHANCING SOIL PROPERTIES AND PREVENTING WATER CONTAMINATION</b>		
<b>36</b>	Over the past three years, how frequently has the orchard floor been tilled (excluding floating, smoothing or rolling)?	<input type="radio"/> 0 times in past 3 years (never) <input type="radio"/> 1-2 times in past 3 years <input type="radio"/> 3 or more times in past three years (every year)
<b>37</b>	Organic soil amendments (e.g., compost) were used to stabilize soil by increasing moisture retention and reducing compaction.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
<b>38</b>	Cover crop (resident ground cover or planted) was intentionally grown between orchard rows. <b><i>If no, then click 'No' and skip to question 41.</i></b>	<input type="radio"/> Yes <input type="radio"/> No
	39. The ground cover was a planted cover crop. <b><i>If No, then click 'No' and skip to question 41.</i></b>	<input type="radio"/> Yes <input type="radio"/> No
	40. The cover crop was selected to stabilize and improve soil (e.g., adding organic matter, water infiltration or managing soil moisture).	<input type="radio"/> Yes <input type="radio"/> No
<b>41</b>	Orchard equipment was chosen (e.g., ATV instead of tractor) or modified (e.g., via wider or bigger diameter tires, or lower tire pressure) to minimize soil compaction.	<input type="radio"/> Yes <input type="radio"/> No
<b>42</b>	Farm roads and/or equipment yards and their margins have been graded or engineered, kept in vegetation or otherwise managed to minimize erosion.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
<b>43</b>	Down-slope orchard margins, stream banks, or other areas prone to runoff had vegetated buffers, fabric fencing, filter strips, straw bale check dams or water bars, sediment basins and/or other means to slow and retain water and filter contaminants (sediment, nutrients and pesticides).	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
<b>44</b>	Drainage and erosion prevention systems were cleaned/maintained prior to the rainy season and checked regularly during stormy periods.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
<b>45</b>	Culverts were properly sized to accommodate high-flow events and had hardened inlets and outlets or energy dissipaters to reduce erosion.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
<b>46</b>	If areas had eroded previously, efforts were made to stabilize (e.g., via geotech fabric or berms) and restore the damaged area.	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
<b>47</b>	Fertilizer storage was secured and measures were taken to minimize any risks (e.g. associated with spills) to humans and environment.	<input type="radio"/> Yes <input type="radio"/> No