Irrigated Lands Regulatory Program (ILRP)

Kern County Coalitions' Joint Grower Education Meeting

Member Meeting

Coalition Leads, D. Ryan Dodd, and Morgan Campbell

Kern River Watershed Coalition Authority

BVWSD – Buena Vista Water Storage District

Cawelo Water District Coalition

WWQC – Westside Water Quality Coalition

December 18, 2019 – Wasco

January 7, 2020 – Bakersfield

January 16, 2020 – Buttonwillow

Kern ILRP Coalitions

- Buena Vista Coalition (BVC)
- Cawelo Water District Coalition (CWDC)
- Kern River Watershed Coalition Authority (KRWCA)
- Westside Water Quality Coalition (WWQC)

BVC

Tim Ashlock
Buena Vista Water Storage District
P. O. Box 756
Buttonwillow, CA 93206

Tel: (661) 206-1101
Fax: (661) 764-5053
E-mail: tim@bvh2o.com
Website: www.bvh2o.com

CWDC

David Hampton, ILRP/Coalition Coordinator
Cawelo Water District Coalition
17207 Industrial Farm Road
Bakersfield, CA 93308

Tel: (661) 393-6072
Fax: (661) 393-6073
E-mail: dhampton@cawelowd.org
Website: www.cawelowd.org

KRWCA

Nicole Bell, Manager
Kern River Watershed Coalition Authority
P.O. Box 151
Bakersfield, CA 93302

Tel: (661) 616-6500
Fax: (661) 616-6550
E-mail: admin@krwca.org
Website: www.krwca.org

WWQC

Kris Lawrence, Coordinator
Westside Water Quality Coalition
21908 7th Standard Rd
McKittrick, CA 93251

Tel: (661) 666-1095
Fax: (661) 762-7223
E-mail: klawrence@lhwd.org
Website: www.wwqc.org

Meeting Attendance Required

- Did you **sign in** for all of your memberships, with each of the Coalitions?
- Annual attendance at an ILRP coalition-sponsored meeting is **required** as a condition of membership if any of your parcels are in:
  - A designated high vulnerability area (HVA); or,
  - Are governed by a Surface Water Quality Management Plan (SQMP) or Groundwater Quality Management Plan (GQMP).

Meeting Attendance Required

Members shall:

- **Register** at each meeting attended for each Membership # (use postcard as ticket to meeting)
- Review outreach materials to become **informed of any water quality problems** to be addressed, **management practices** that are available to address those issues; and reporting requirements
- Provide each Coalition with **Annual Certification** of the above.

Member Reports Due

- **Farm Evaluation (2019 crop/harvest year)**
  - No Farm Evaluation due for the 2019 crop/harvest year
- **Irrigation Nitrogen Management Plan Worksheet (2020 crop/harvest year) NEW Template**
  - Required to be completed by ALL members by March 1, 2020.
  - Certification is required for ALL farms with parcels designated in an HVA.
  - Remains on-farm: is **NOT** submitted to the Coalition.
- **Nitrogen Management Plan Summary Report (2019 crop/harvest year)**
  - Members designated within an HVA are required to complete by March 1, 2020.
  - NMP Summary Report **IS** submitted to Coalition.

Due Dates for Required Reports

Report	Vulnerability	Farm Size	Due Date	Renewal Frequency
Farm Evaluation	All	All	**March 1, 2021**	Five Years
Sediment and Erosion Control Plans	All Farms identified in the Sediment Discharge and Erosion Assessment Report (SDEAR), or self-identified on Farm Evaluation	Large (≥ 60 ac)	**April 4, 2016**	As conditions change
		Small (< 60 ac)	**October 7, 2016**	As conditions change
Irrigation and Nitrogen Management Plan Worksheet	All	All	**March 1, 2020**	Annually
NMP Summary Report	HVA Only Certification NOT required	All	**March 1, 2020**	2020 is last year of NMP Summary Report
Irrigation and Nitrogen Management Plan Summary Report*	All *Certification REQUIRED if HVA membership	All	**March 1, 2021**	Annually
Management Practice Implementation Report	Members in areas subject to a SQMP or GQMP	All	**March 1, 2021**	Annually

SECP Required If "IN"

Load Member || Member: ABC Test Farm (00000) Monitoring Well

Currently Enrolled APNs | Membership APN History | APN Op

Enrollment Year 2019

Land Area Summary

130.47 Irrigated Acres (Enrolled Acres)

160.97 APN Acres (GIS Acres)

Large Fa

11 N22 W15 Pr

Enrolled APNs Generate Printable Report Generate Excel Report

APN	County	Associated with Field	APN Acres (GIS Acres)	Irr Acres (Enrolled Acres)	Vulnerability		
					Surface	Groundwater	Sediment & Erosion
001-001-01	Kern	yes	80.48	50.00	Low	High	Out
002-002-02	Kern	yes	80.49	80.47	Low	Low	Out

SECP Required If "IN"

If Sediment & Erosion column = "IN"
SECP Plan REQUIRED

Vulnerability		
Surface	Groundwater	Sediment & Erosion
Low	High	Out
Low	Low	Out

March 1, 2020 Deadline

Please Note: there will be **NO EXTENSIONS** to the March 1, 2020 reporting deadline mandated by the Tulare Lake Basin General Order.

On-Farm Drinking Water Well Testing

NEW REQUIREMENT FOR 2020

- All drinking water wells on enrolled parcels must be tested **annually** for Nitrate + Nitrite as N.
  - Sampling window is January 1, 2020 – December 31, 2020.
  - Must use an ELAP certified laboratory
  - Regional Board has mailed outreach packets with additional information on the requirements.
- If the result is **over the MCL of 10 mg/L**, member must provide notice to users, within 10 days, using the nitrate notification template and send a copy of the completed template to the Regional Board. See Template on next slide.
- To comply, data must be submitted to the Geotracker state database directly from the lab.

DO NOT DRINK YOUR WATER

USE ONLY BOTTLED WATER UNTIL FURTHER NOTICE

Failure to follow this advisory could result in serious illness.

Test Result: _____mg/L

Your drinking water well was recently tested, and nitrates were found to exceed the maximum level of 10 mg/L established by the State and Federal drinking water standards for safe drinking water.

Pregnant women are at increased risk for potential health effects and should not drink water with high levels of nitrate. Drinking water with high nitrate levels may also cause serious complications in pregnancy.

Do not give the water to infants. Infant formula and other edible products should be prepared with bottled water or other water with low levels of nitrate. Infants are at increased risk to become seriously ill or even death from consumption of high levels of nitrate.

Do not boil your water. Boiling your water may increase nitrate levels.

For more information contact the Central Valley Water Board:

- Phone: Sacramento Office (916) 464-4611 or Email: irrlands@waterboards.ca.gov
- Phone: Fresno Office (559) 488-4396 or Email: ilrpinfo@waterboards.ca.gov

Also visit us on the web: https://www.waterboards.ca.gov/gama/docs/coc_nitrate.pdf
https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/drinking_water/

This notification was provided by:

Landowner/Member Name: _____

Landowner/Member Signature:_____ Date: _____

Assessor's Parcel Number: _____

- ☐ Notification has been provided to the users or appropriate landowner
- ☐ Replacement water has been provided to the user

On-Farm Drinking Water Well Testing

You do NOT need to test your well if:

- It is NOT being used for human consumption (drinking or cooking).

Farm Evaluations

Morgan Campbell, Scientist

2018 Crop Harvest Year Farm Evaluation

2018 Results Overview

2018 Crop Harvest Year Farm Evaluation Overview

A summary of practices within the coalition area.

Describes the practices used on-farm for protecting surface and groundwater quality.

Data is summarized and records are provided on a township basis to the Water Board.

Some priority practices are required under the General Order.

<u>NO FARM EVALUATION DUE IN 2020.</u>

ILRP Farm will lock you out of the Farm Evaluation.

2018 Crop Harvest Year Farm Evaluation Overview

Part A & B

- Cover all lands in the membership (whole farm) and is completed once per report

Part C

- Field/crop specific practice information
- Respond for each unique combination of crop/ management practices represented on a field or group of fields

Part D

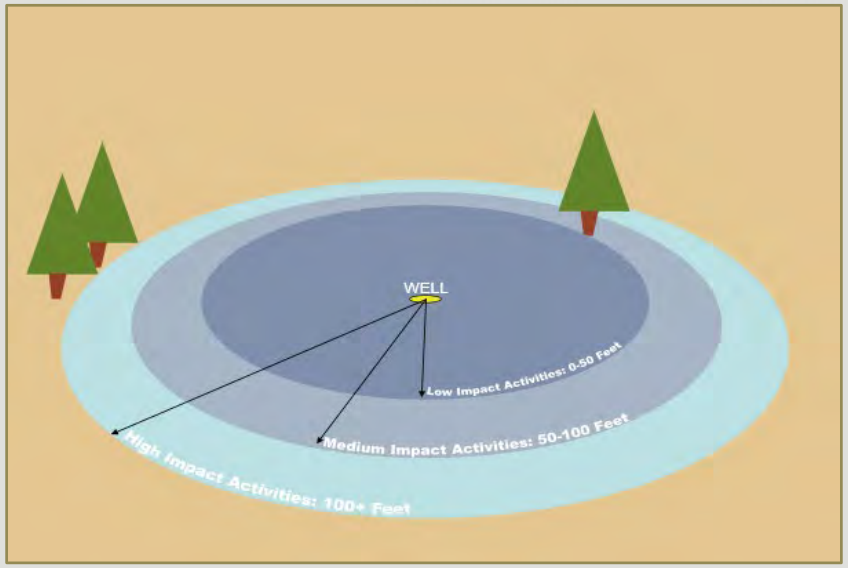
- Grower-produced map to be kept on-farm, available for inspection, do **NOT** submit to the Coalition

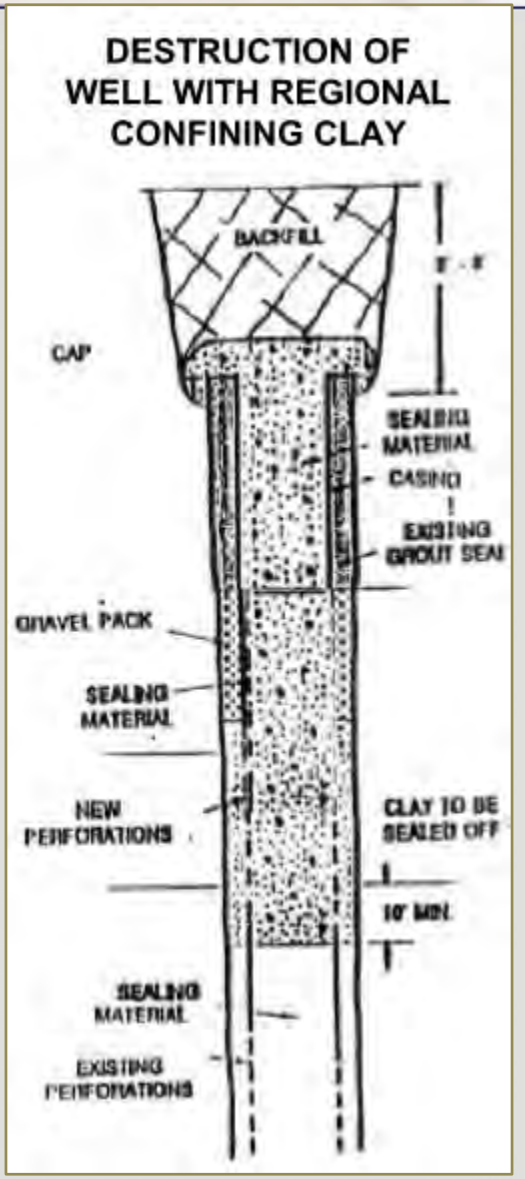
Part E

- Sediment and erosion control practice information
- Respond for each unique combination of practices represented on a field or group of fields

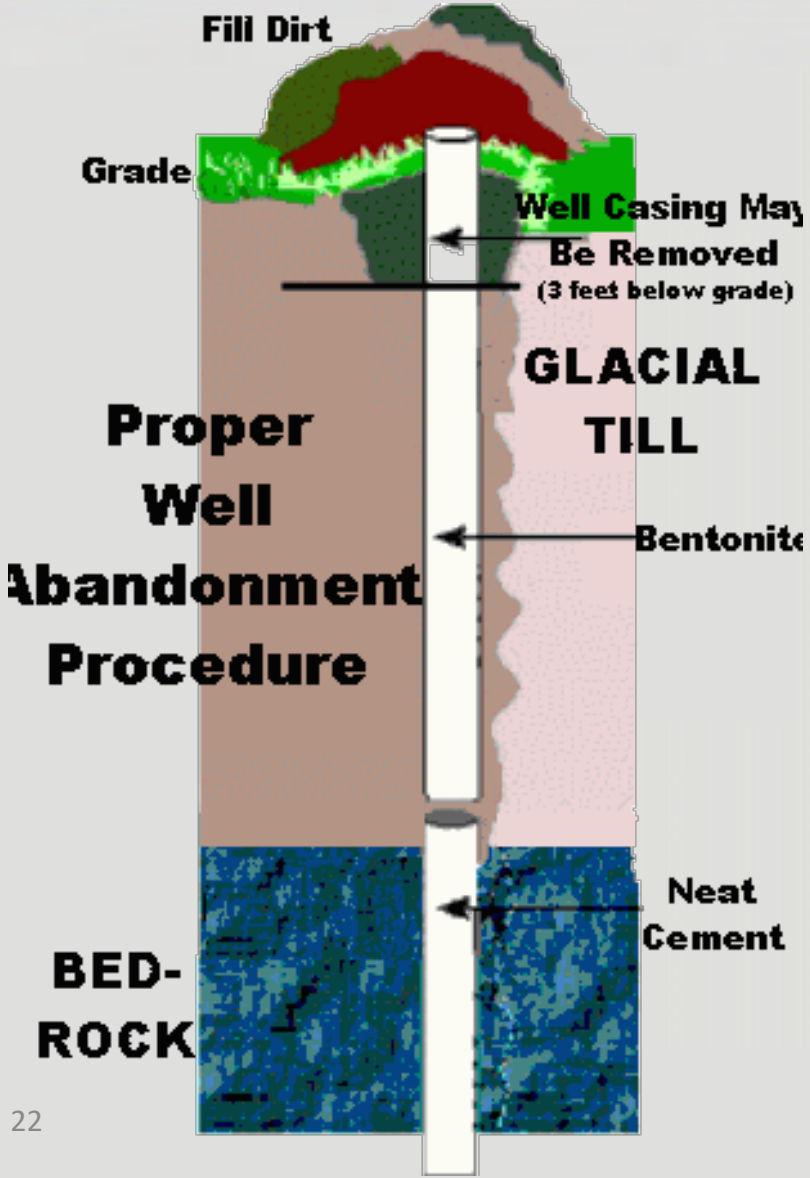
Priority Practices

1. Well destruction/abandonment practices (Part B1)
2. Well head protection practices (Part B2)
3. Accounting for nitrogen in irrigation water (Part C)





Priority Practices: Irrigation & Abandoned Wells



- Wells are a **direct path** to groundwater
- General Order requires that members ensure:
  - All abandoned wells must be **properly destroyed**. See Kern County Environmental Health Services (EHS) instructions for appropriate destruction procedures.
  - Wellheads must be **protected from surface water intrusion.**

Priority Practices: Irrigation & Abandoned Wells

Farm Evaluation Part B:

Irrigation Wells: **wellhead protection practices**

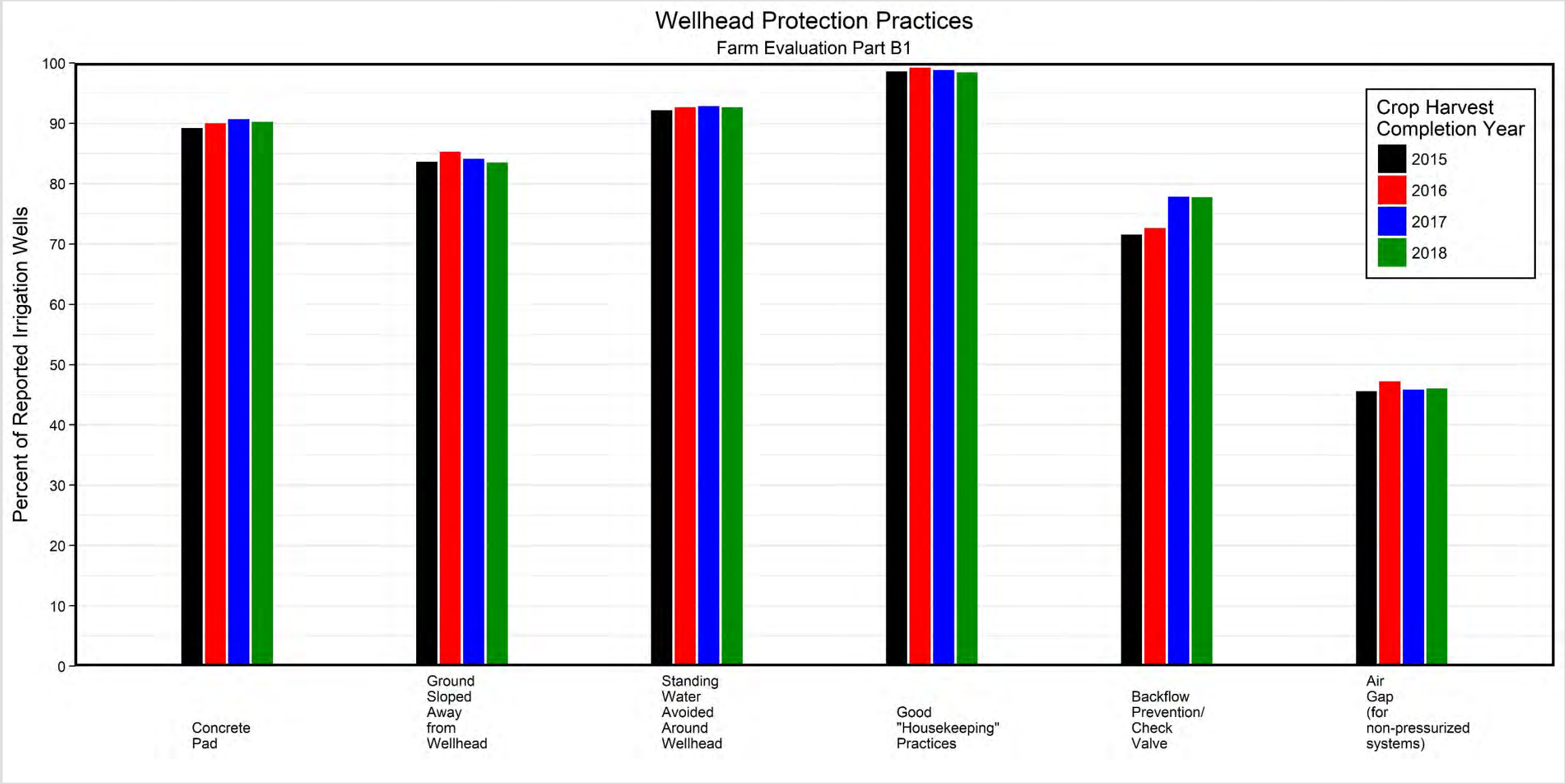
- Backflow Prevention/Check Valve
- Air Gap (for non-pressurized systems)
- Good Housekeeping Practices
- Standing Water Avoided Around Wellhead
- Ground Sloped Away From Well Head
- Concrete Pad

- **Abandoned Wells**: Method of destruction
  - County, Professional, or “Unknown”

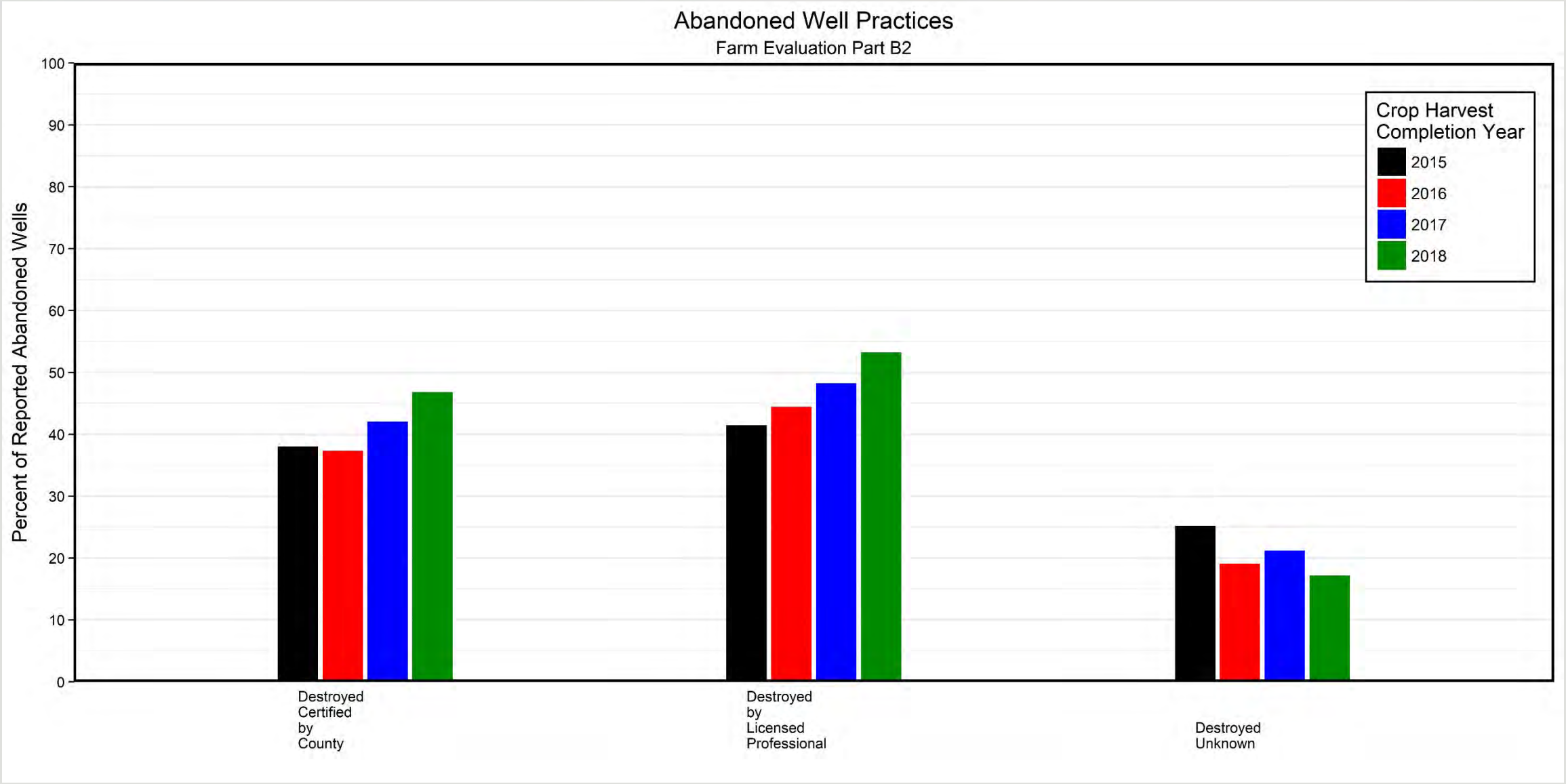
2018 Crop/Harvest Year Farm Evaluation Results

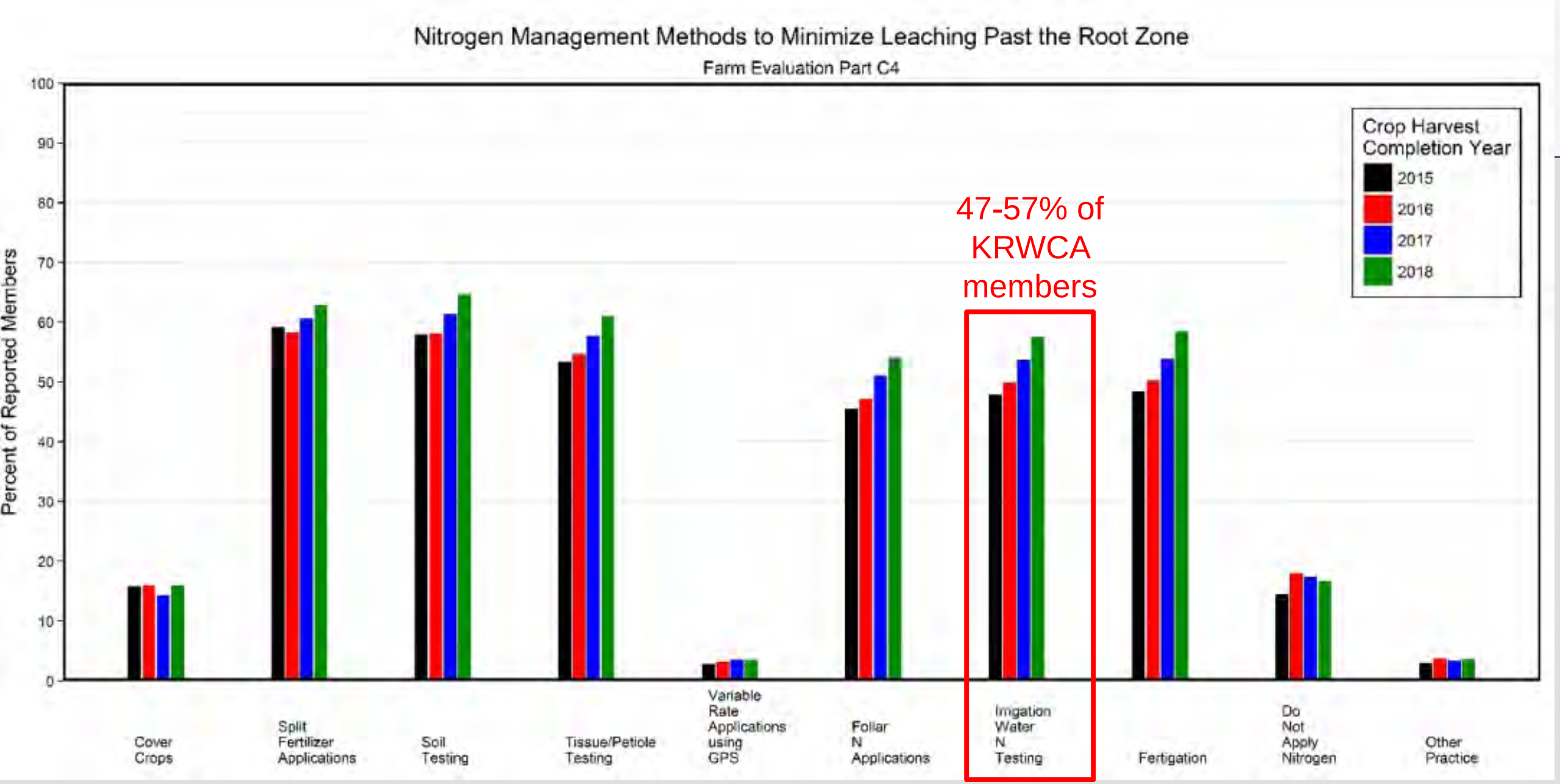
- High Vulnerability Farms were required to complete a 2018 Crop Harvest Year Evaluation.
- KRWCA had over a **99%** submission rate (acres).

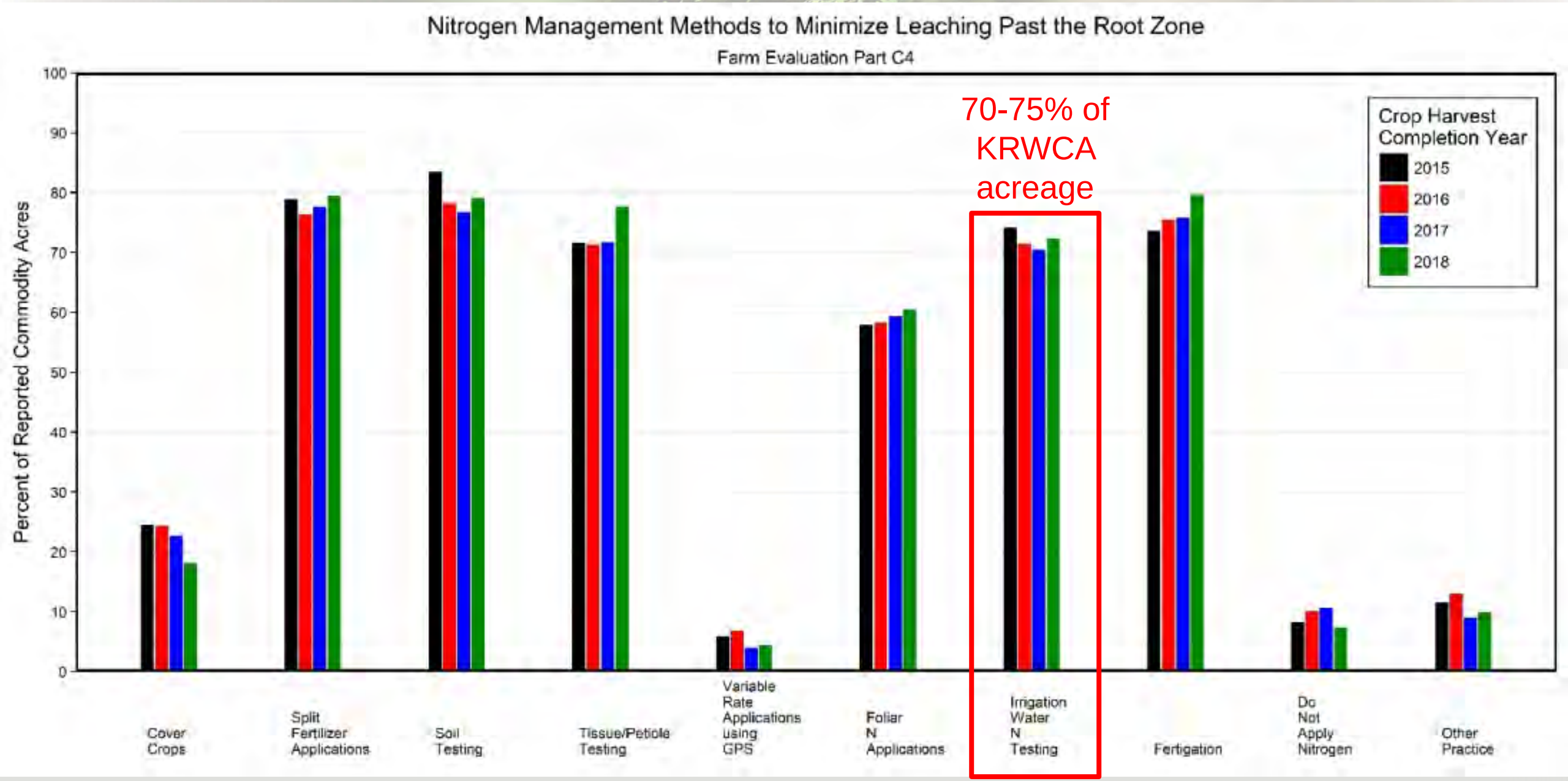
2018 Harvest Year Priority Practices: Well Protection



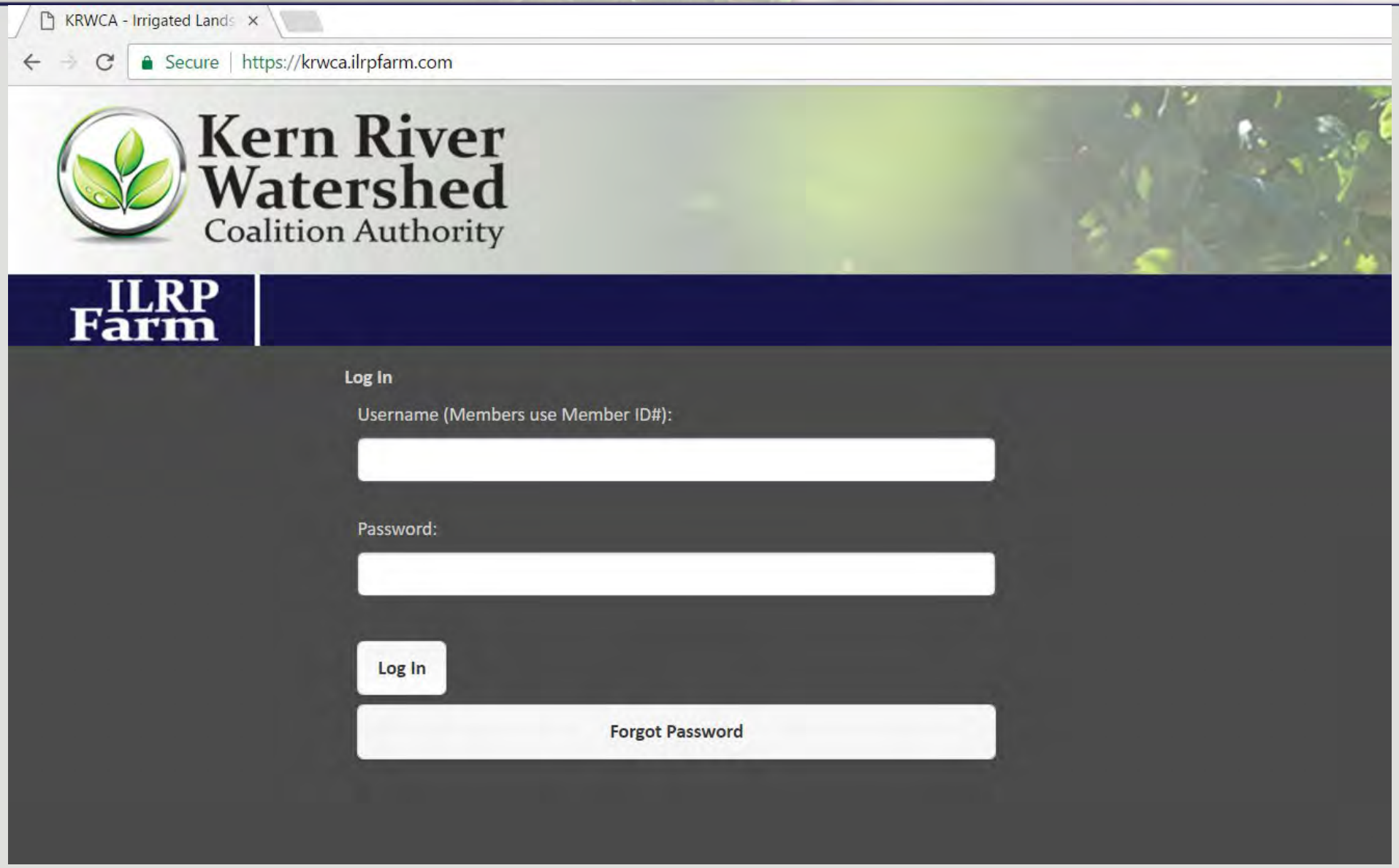
2018 Harvest Year Priority Practices: Abandoned Well Destruction




Nitrogen Management Methods to Minimize Leaching Past the Root Zone
Farm Evaluation Part C4
Percent of Reported Members
100
90
80
70
60
50
40
30
20
10
0
Crop Harvest Completion Year
2015
2016
2017
2018
47-57% of KRWCA members
Cover Crops
Split Fertilizer Applications
Soil Testing
Tissue/Petiole Testing
Variable Rate Applications using GPS
Foliar N Applications
Irrigation Water N Testing
Fertigation
Do Not Apply Nitrogen
Other Practice


Nitrogen Management Methods to Minimize Leaching Past the Root Zone
Farm Evaluation Part C4
Percent of Reported Commodity Acres
100
90
80
70
60
50
40
30
20
10
0
70-75% of KRWCA acreage
Crop Harvest Completion Year
2015
2016
2017
2018
Cover Crops
Split Fertilizer Applications
Soil Testing
Tissue/Petiole Testing
Variable Rate Applications using GPS
Foliar N Applications
Irrigation Water N Testing
Fertigation
Do Not Apply Nitrogen
Other Practice

ILRP Farm: Online Submissions



ILRP Farm Online Submittal

1. Create your Farm in “Farm Builder"

- Define fields associated with all APNs enrolled from January 1
- Define cropping and irrigation practice for fields
- Update all inactive crop ID’s on copied over fields
- Enter the date planted for permanent crops
- Enter the field acres per APN associated with a field to equal total field acres

2. Quality Assurance/Quality Control (QA/QC) checks:

- Every APN enrolled from Jan. 1 must be assigned to at least one field
- Field acres much match ALL irrigated acres enrolled from Jan. 1-Dec. 30

Farm Builder: Common Issues

- Reported **field acres and APNs** MUST match enrolled **irrigated acres** for the reporting year (Jan 1-Dec 31)
- Must create fields applicable to your NMP Summary Report
- Copied over fields:
  - **Inactive crop types** must be updated to the **current** year crop list
  - Must create new fields for **new or changed APNs** in the reporting year
  - Must update permanent cropped fields with **planted date**
  - Must update multi-APN fields with **field acres per APN (critical)**

ield Information
Create New Fields and Edit Existing Fields Below)

Clear to Add New | Copy Fields From Previous Year

ield Id*

ield Acres *

rimary APN * 028-010-62

Add/Edit APNs

ADD ALL APNs ASSOCIATED

Primary Crop

Crop Description

Primary Irrigation: Drip

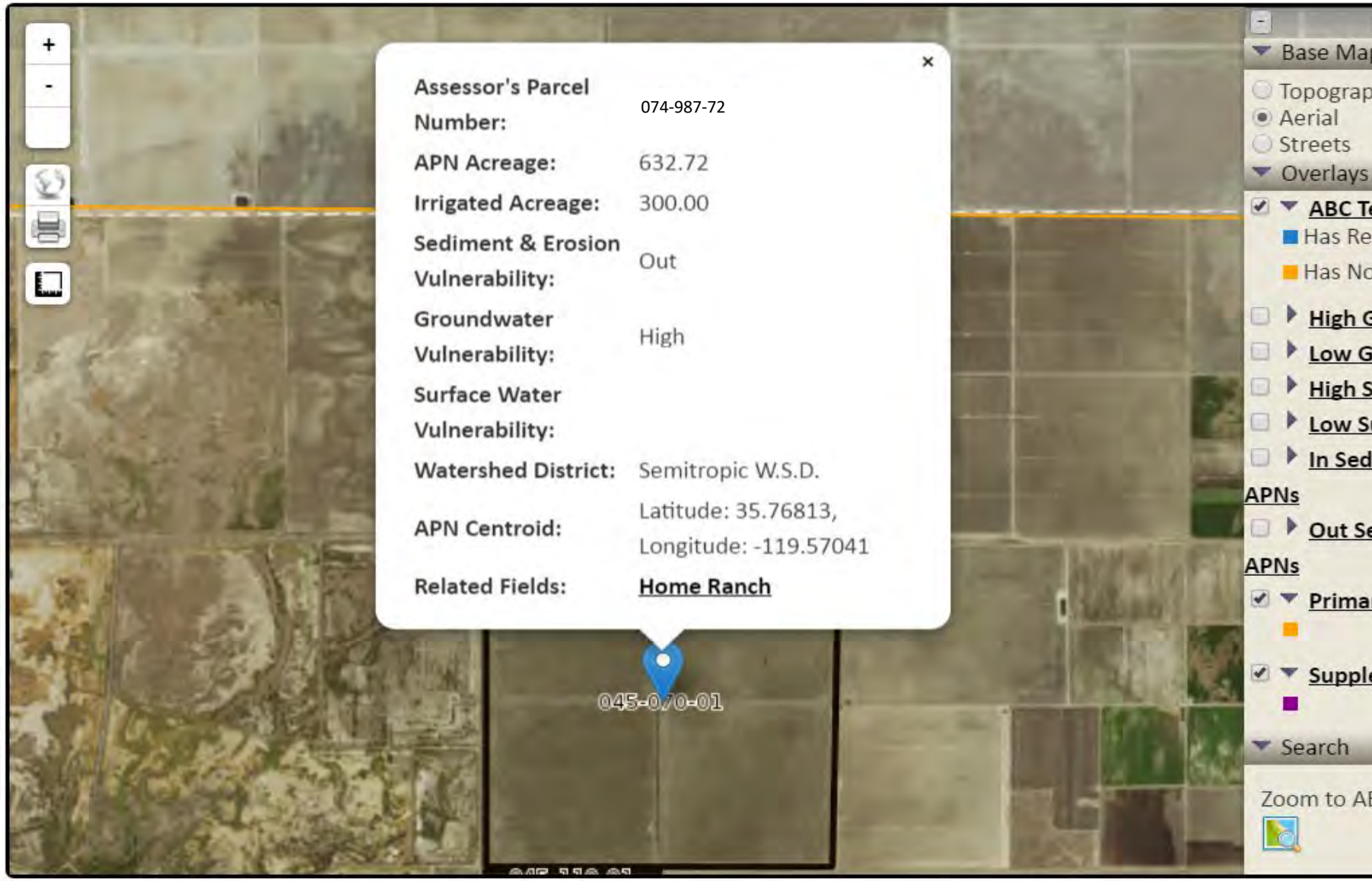
Secondary Irrigation

Second Crop

Third Crop

Save Changes

Refresh page after Saving



Irrigated Acres must match total Field Acres, all enrolled APNs must be accounted for (enrolled from Jan 1-Dec 31).

1,537.23 APN Acres
880.00 Irrigated Acres
880.00 Field Acres

3 Membership APNs
3 APNs Associated with Fields
0 APNs with no Fields Associated

Second Crop

Third Crop

Save Changes

Refresh page after Saving

156.36	APN Acres	**2**	Membership APNs
880.00	Irrigated Acres	**2**	APNs Associated with Fields
880.00	Field Acres	**0**	APNs with no Fields Associated

Membership Fields | Farm Builder Summary PDF | Farm Builder Summary Excel | Search:

Edit / Delete	Field Id	Field Acres	Crop	Primary Irrigation	Secondary Irrigation	Primary APN	Other APNs
	A	160	Citrus Oranges	Primary Drip	Secondary None	045-110-01	
	B	80	Citrus Oranges	Primary Drip	Secondary None	045-110-01	
	C	40	Citrus Oranges	Primary Drip	Secondary None	045-110-01	
	Home Ranch 1	300	Citrus Oranges	Primary Drip	Secondary None	045-070-01	
	Home Ranch 2	300	Citrus Oranges	Primary Drip	Secondary None	045-070-01	

You must “build” all fields via ILRP Farm – Farm Builder before you can complete the NMP Summary Report for each field

Field Information
(Create New Fields and Edit Existing Fields Below)

Clear to Add New | Copy Fields From Previous Year

Field Id* A

Field Acres * 160

Primary APN * 045-260-04

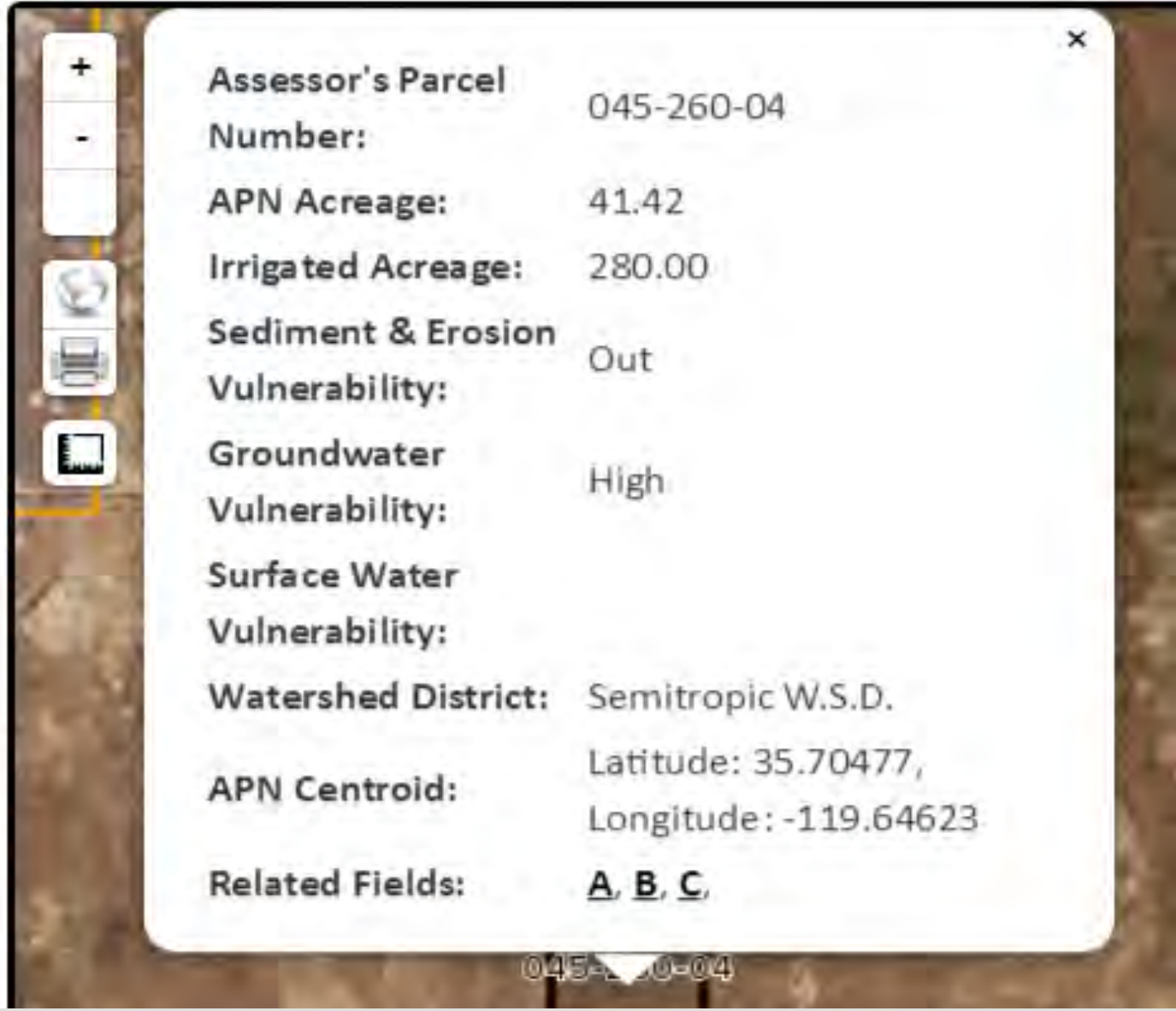
Primary Crop - Nut Crops - Almonds

Crop Description: Nut Crops - Almonds

Primary Irrigation: Drip

Secondary Irrigation: Border Strip

Date Planted: 2003-01-01



Enter approximate “Date Planted” for all permanent cropped fields.

Field Information
(Create New Fields and Edit Existing Fields Below)

Clear to Add New | Copy Fields From Previous Year

Field Id* Salt Ranch

Field Acres * 600

Primary APN * 047-170-04

Primary Crop - Nut Crops - Almonds

Second Crop

Third Crop

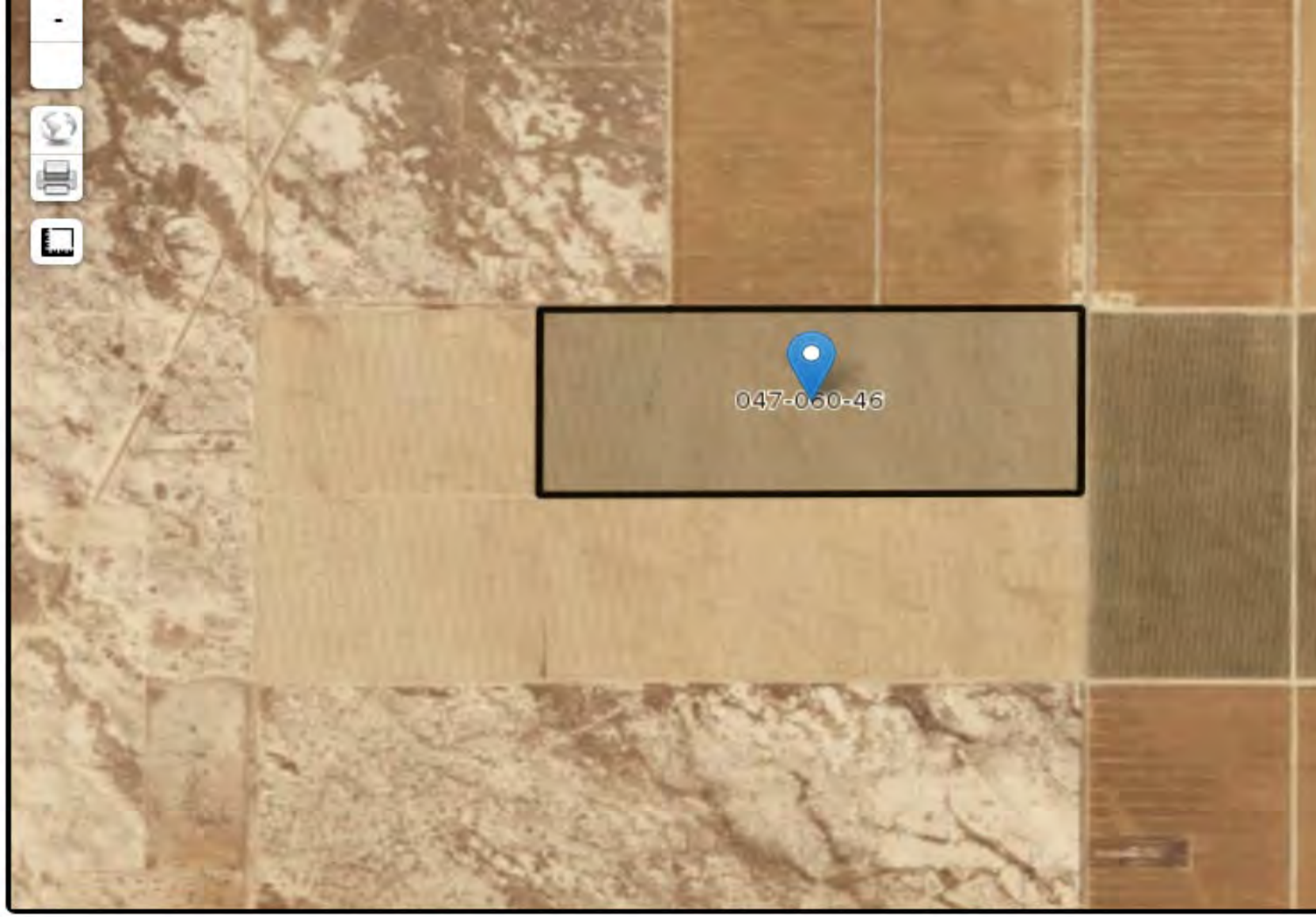
Add/Edit APNs

Add more APNs associated with this field.
Estimate what portion of the total field acres are on each APN.

APN [ ] Add

Delete APN		Field Acres	
⊖	047-170-04	300	Update Acres
⊖	047-060-46	300	Update Acres
	Sum	600	

Save



You must define the field acres per APN associated with a field. The sum of field acres per APN must equal the total field acres.

Field Information

(Create New Fields and Edit Existing Fields Below)

Clear to Add New | Copy Fields From Previous Year

Field Id*

Field Acres *

Primary APN * 103-180-08

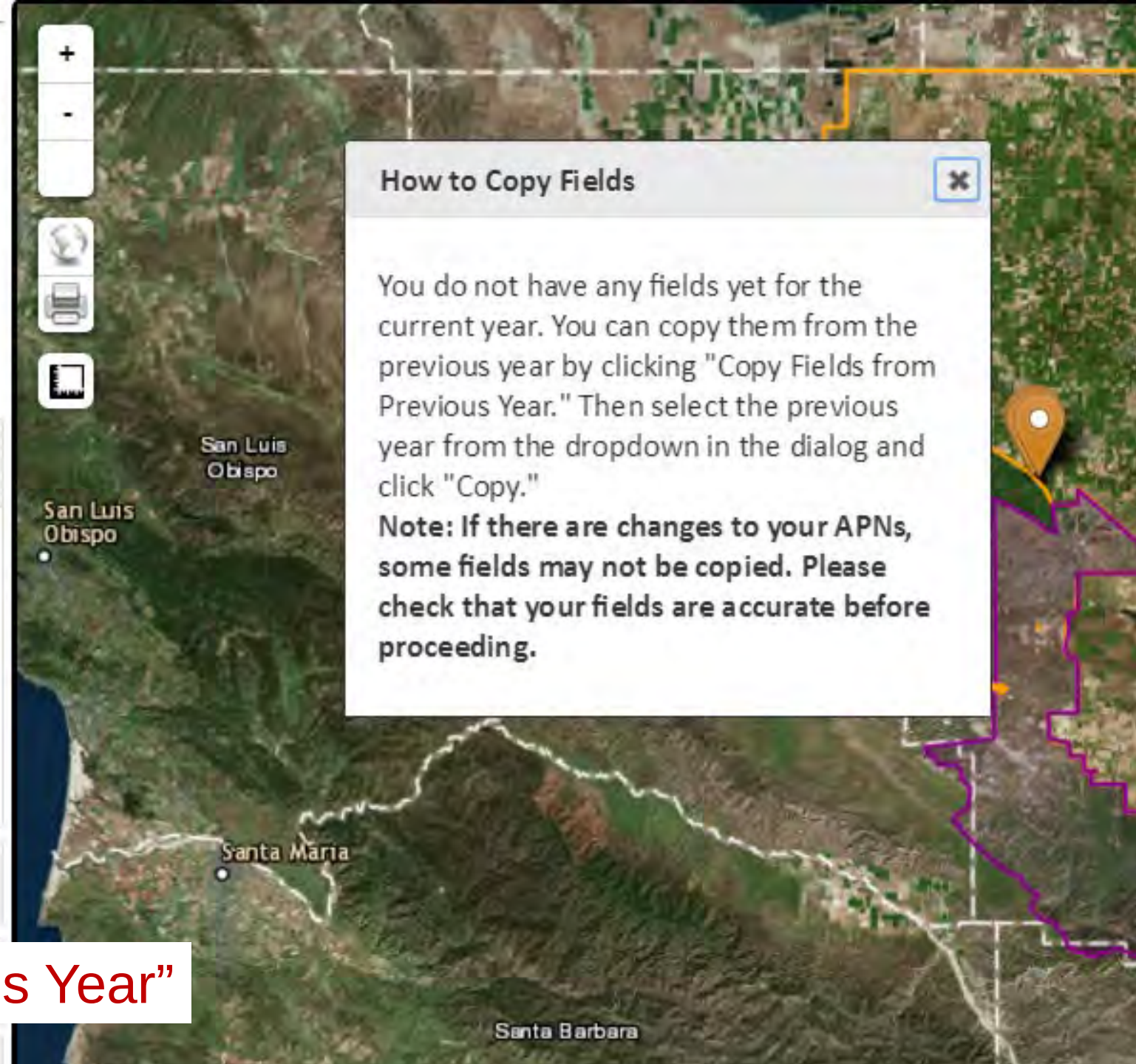
Primary Crop

Crop Description

Primary Irrigation: Drip

Secondary Irrigation

Second Crop



"Copy Fields From Previous Year"

Second Crop

Third Crop

Save Changes

Refresh page after Saving

Supplementary Boundary

Search

Zoom to ABC Test Farms APNs:

156.36	APN Acres	**2**	Membership APNs
880.00	Irrigated Acres	**2**	APNs Associated with Fields
880.00	Field Acres	**0**	APNs with no Fields Associated

Membership Fields | Farm Builder Summary PDF | Farm Builder Summary Excel | Search:

Edit / Delete	Field Id	Field Acres	Crop	Primary Irrigation	Secondary Irrigation	Primary APN	Other APNs
	A	160	Peaches & Nectarines	Primary Drip	Secondary None	045-110-01	
	B	80	Citrus Oranges	Primary Drip	Secondary None	045-110-01	
	C	40	Citrus Oranges	Primary Drip	Secondary None	045-110-01	
	Home Ranch 1	300	Citrus Oranges	Primary Drip	Secondary None	045-070-01	

Inactive crop ID's will show up red in your field list, you must update them to the current crop list to successfully submit reports. Also added additional crops, so some users will have to reselect crop type.

Nitrogen Reporting and NARs

D. Ryan Dodd, CPSS, CCA, TSP

Soil Scientist/Agronomist

Nitrogen Reports – 2020 Calendar Year Deadlines

Report	Farm Size	Vulnerability	Deadline	Frequency	Certification
Nitrogen Management Plan (NMP) Summary Report	All	High (HVA)	**March 1, 2020** (Submit to Coalition via ILRP Farm)	Annually (2020 last year of NMP SR)	n/a
		Low (LVA)	Not Required		
NEW: Irrigation & Nitrogen Management Plan (INMP) Worksheet	All	High (HVA)	**March 1, 2020** (stays on farm)	Annually	Certify
		Low (LVA)	**March 1, 2020** (stays on farm)	Annually	Only if you have nitrogen outlier fields (from NARs)

Crop Harvest Year Information

- "**Crop Harvest Years**" are defined as the *calendar year* in which crop harvest was *completed*
- Sometimes also called a "Crop Harvest Completion Year"
- **Almonds example**:
  - Crop harvest completed in August 2019 → 2019 Crop Harvest Year
  - Data Reported to coalitions via ILRP Farm NMP Summary Report by March 1, 2020
- **Winter Wheat Example**
  - Crop harvest completed in April 2019 → 2019 Crop Harvest Year
  - Data from completed harvest reported to coalitions by March 1, 2020
- **Navel Oranges Example** – (Citrus guidance document available on website)
  - Crop harvest started in October 2019 but completed in April 2020 → 2020 Crop Harvest Year
  - Data from completed harvest reported to coalitions by March 1, 2021
- **This presentation covers**:
  1. 2019 Crop Harvest Year NMP
  2. 2019 Crop Harvest Year NMP Summary Report
  3. 2020 Crop Harvest Year INMP

Three (3) simultaneous and parallel categories of forms to manage and complete

2019 Crop Harvest Year NMP and NMP Summary Reporting Process; 2020 Crop Harvest Year INMP

1. Complete 2019 Crop Harvest Year NMP Actual column and NMP Summary Report
2. ***Input data into ILRP FARM*** - 2019 Crop Harvest Year
3. Complete basic member and field info and note assumptions
4. Calculate crop water use values (ET)
5. Review previous year's NAR
6. Determine overall nitrogen requirement (from all sources)
7. Account for all "credits" (e.g. N from irrigation water)
8. Fertilizer N makes up difference between recommendation and credits
9. If required, certify INMP by March 1
10. Monitor and adjust INMP through growing season, as needed
11. Complete "actual" column after season is completed
12. Complete 2020 Crop Harvest Year INMP Summary Report by March 1, 2021

Crop Harvest Year	Item
2019	NMP
2019	NMP Summary Report
2020	INMP

NMP Step 1: NMP Actual Column & NMP Summary Report

- Complete the NMP "**Actual N**" column once harvest is completed and all data is available

- Use the Actual N column to complete **NMP Summary Report** by March 1, 2020

NITROGEN MANAGEMENT PLAN WORKSHEET

		4. APN(s):	5. Field(s) ID:	
1. Crop Year, (Harvested):	2019	002-002-02	Almond 1	80
2. Member ID#	00000			
3. Name:				
ABC Test Farm				

CROP NITROGEN MANAGEMENT PLANNING		N APPLICATIONS/CREDITS	26. Recommended/ Planned N	27. Actual N
6. Crop:	Almonds	**15. Nitrogen Fertilizers**		
7. Production Unit:	pounds	16. Dry & Liquid N (lbs/ac)	143	189
8. Projected Yield (Unit/Acre):	2,000	17. Foliar N fertilizers (lbs/ac)	8	10
9. N Recommended (lbs/ac):	219	**18. Organic Material N**		
10. Acres:	80	19. Available N in Manure/Compost (lbs/ac estimate)	0	0
Post Production Actuals				
11. Actual Yield (Unit/Acre):	2,500	20. Total Available N Applied (lbs per acre)	150	199
12. Total N Applied (lbs/ac):	268	**21. Nitrogen Credits (est)**		
13. ** N Removed (lbs N/ac):	195	22. Available N carryover in soil (annualized, lbs/ac)	25	25
A/Y Ratio (lbs N/unit/ac):	0.0971	23. N in Irrigation water (annualized, lbs/ac)	44	44
14. Notes:		24. Total N Credits (lbs per acre)	69	69
-Mature trees. 80% of irrigation from well (4 mg/L NO3-N) and 20% from district water (1 mg/L NO3-N). ETc 50 inches, 90% irrigation efficiency. N removal rate from FREP = 68 lbs N per 1000 lbs kernels; 70% NUE.		25. Total N Applied & Available	219	268

PLAN CERTIFICATION		
28. CERTIFIED BY:	29. CERTIFICATION METHOD	X
ABC Test Farm	30. Low Vulnerability Area, No Certification Needed	
	31. Self-Certified, approved training program attended	x
DATE:	32. Self-Certified, UC or NRCS site recommendation	
2/1/2019	33. Nitrogen Management Plan Specialist	

** Your Coalition will provide the method to be used to estimate N Removed.

Provided by the Central Valley Water Board 23 December 2014

1

Step 1: Last Year of NMP Summary Report

Nitrogen Management Plan Summary Report

Crop Harvested Year (1): 2019

Submittal Date: 01/25/20

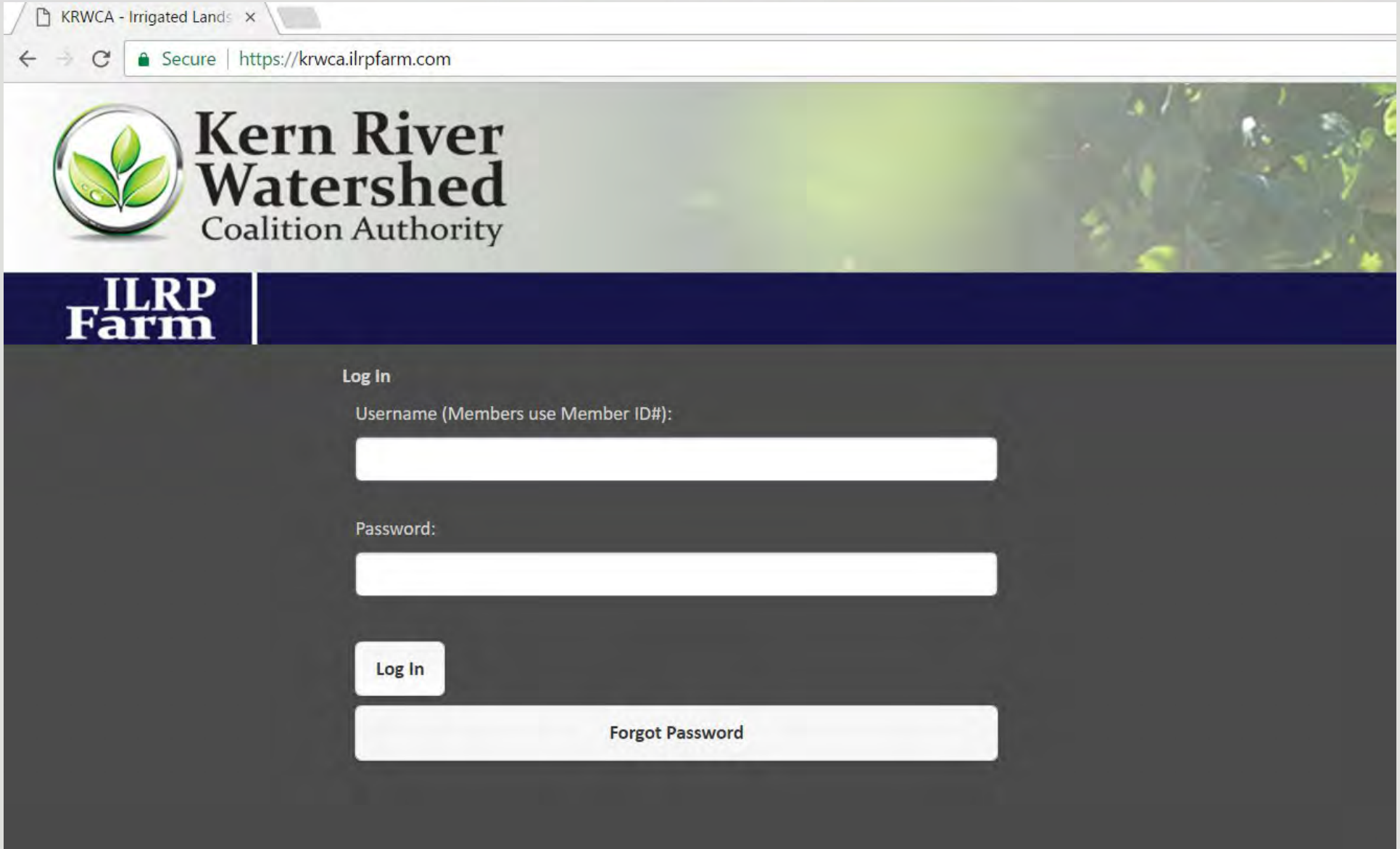
Member ID (2): 0

Member Name (3): ABC Test Farm

	Site Location Information[1]		Crop (6)	Total Acres (10)	Total Available N Applied (20+23)	A/Y Total Available N (20+23)/Actual Yield (11)[2]	Production Unit (7)
	APN (4):	Field ID (5)					
1	002-002-02	Almond 1	Almonds	80	243	0.0971	pounds
2							

This is an example of the “paper” version of the NMP SR. Note that KRWCA requires online submittal via ILRP Farm, and it is strongly encouraged for all other coalitions.

Step 2: ILRP Farm: Online Submissions



ILRP Farm

Kern River Watershed Coalition Authority

- Member Profile
- APN Enrollment
- Maps
- Farm Builder
- Farm Evaluation
- NMP Summary Report
- Generate Reports

ABC Test Farm (00000)

Harvest Year 2019

Outreach Attendance Certification

Annual confirmation to the third-party that the Member or Designee has attended an outreach event in the previous year, and that the Member/Designee was personally informed of the content of the outreach event and was provided with copies of all outreach materials.

☑ *Yes, I confirm these statements. (check box)*

NMP Summary Report Status

Currently there are 1 out of 3 fields completed

Submit the NMP Summary Report

You must submit the Nitrogen Summary Report electronically to the Coalition and you MUST print the Nitrogen Summary Report to keep on-site at your farming operation. Select the submit and print buttons below when your Nitrogen Summary Report is complete.

Member Name Date *ex: mm/dd/yyyy*

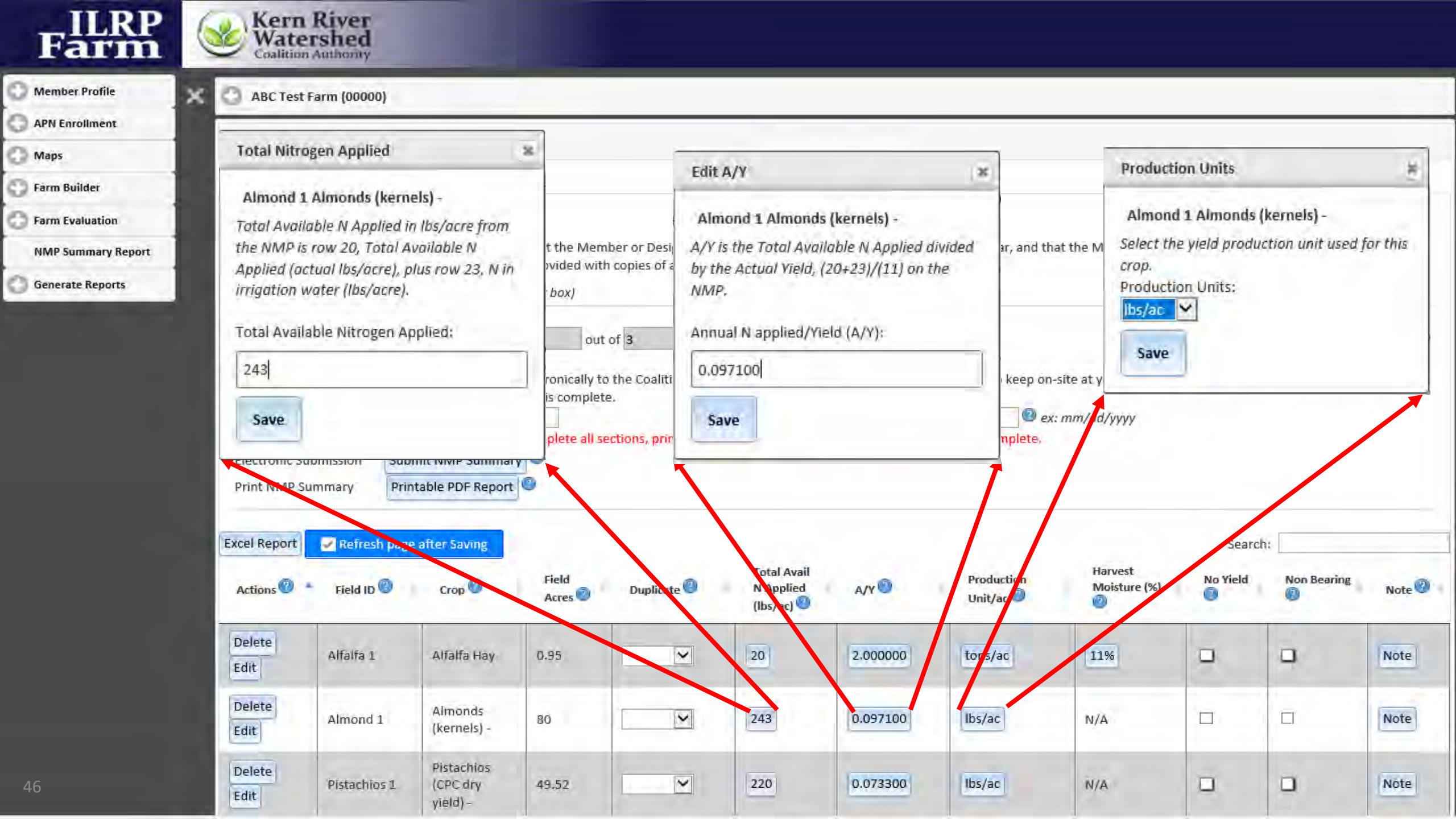
Your Nitrogen Summary is Incomplete. You must complete all sections, print your name, date, and submit your evaluation to be complete.

Electronic Submission Submit NMP Summary

Print NMP Summary Printable PDF Report

Excel Report ☑ Refresh page after Saving Search:

Actions	Field ID	Crop	Field Acres	Duplicate	Total Avail N Applied (lbs/ac)	A/Y	Production Unit/ac	Harvest Moisture (%)	No Yield	Non Bearing	Note
Delete Edit	Alfalfa 1	Alfalfa Hay	0.95		Respond	Respond	Respond	Respond	☐	☐	Note
Delete Edit	Almond 1	Almonds (kernels) -	80		243	0.097100	lbs/ac	N/A	☐	☐	Note
Delete Edit	Pistachios 1	Pistachios (CPC dry yield) -	49.52		Respond	Respond	Respond	N/A	☐	☐	Note


ILRP Farm
Kern River Watershed Coalition Authority
Member Profile
APN Enrollment
Maps
Farm Builder
Farm Evaluation
NMP Summary Report
Generate Reports
ABC Test Farm (00000)
Total Nitrogen Applied
Almond 1 Almonds (kernels) -
Total Available N Applied in lbs/acre from the NMP is row 20, Total Available N Applied (actual lbs/acre), plus row 23, N in irrigation water (lbs/acre).
Total Available Nitrogen Applied:
243
Save
Edit A/Y
Almond 1 Almonds (kernels) -
A/Y is the Total Available N Applied divided by the Actual Yield, (20+23)/(11) on the NMP.
Annual N applied/Yield (A/Y):
0.097100
Save
Production Units
Almond 1 Almonds (kernels) -
Select the yield production unit used for this crop.
Production Units:
lbs/ac
Save
Print NMP Summary
Printable PDF Report
Excel Report
Refresh page after Saving
Search:
Actions
Field ID
Crop
Field Acres
Duplicate
Total Avail N Applied (lbs/ac)
A/Y
Production Unit/ac
Harvest Moisture (%)
No Yield
Non Bearing
Note
Delete
Edit
Alfalfa 1
Alfalfa Hay
0.95
20
2.000000
tons/ac
11%
Note
Delete
Edit
Almond 1
Almonds (kernels) -
80
243
0.097100
lbs/ac
N/A
Note
Delete
Edit
Pistachios 1
Pistachios (CPC dry yield) -
49.52
220
0.073300
lbs/ac
N/A
Note

ILRP Farm | Kern River Watershed Coalition Authority

- Member Profile
- APN Enrollment
- Maps
- Farm Builder
- Farm Evaluation
- NMP Summary Report
- Generate Reports

ABC Test Farm (00000)

NOTE: Green text: "Nitrogen Summary Has Been Submitted"

Harvest Year 2019

Outreach Attendance Certification

Annual confirmation to the third-party that the Member or Designee has attended an outreach event in the previous year, and that the Member/Designee was personally informed of the content of the outreach event and was provided with copies of all outreach materials.

☑ *Yes, I confirm these statements. (check box)*

NMP Summary Report Status

Currently there are 3 out of 3 fields completed

Submit the NMP Summary Report

You must submit the Nitrogen Summary Report electronically to the Coalition and you MUST print the Nitrogen Summary Report to keep on-site at your farming operation. Select the submit and print buttons below when your Nitrogen Summary Report is complete.

Member Name ABC Test Farm Date 2020-01-04 *ex: mm/dd/yyyy*

Nitrogen Summary Has Been Submitted

Electronic Submission: Submit NMP Summary

Print NMP Summary: Printable PDF Report

Excel Report | ☑ Refresh page after Saving | Search:

Actions	Field ID	Crop	Field Acres	Duplicate	Total Avail N Applied (lbs/ac)	A/Y	Production Unit/ac	Harvest Moisture (%)	No Yield	Non Bearing	Note
Delete Edit	Alfalfa 1	Alfalfa Hay	0.95		20	2.000000	tons/ac	11%	☐	☐	Note
Delete Edit	Almond 1	Almonds (kernels) -	80		243	0.097100	lbs/ac	N/A	☐	☐	Note
Delete Edit	Pistachios 1	Pistachios (CPC dry yield) -	49.52		220	0.073300	lbs/ac	N/A	☐	☐	Note

Common Reporting Errors from the NMP Summary Report

- **Calculation errors** / general misunderstanding
- Not reporting items on a **per-acre** basis. Incorrect date planted values
- Mismatching or incorrect usage of **production units of A/Y** (e.g. tons used to calculate yield, but pounds selected)
- Reporting an A/Y value when No Yield or Non-Bearing was selected
- Entering a text response for Total N Applied or A/Y
- Inappropriately averaging across "**management units**" (report on field basis)
- Not or incorrectly accounting for crop **moisture** (field crops only)
- Overall in KRWCA for the 2018 Crop Harvest Year, only 5,671 reported commodity acres (1.1%) flagged as "potentially questionable" data. – **VERY impressive results**!

ILRP Farm: Live Validation

Extensive “Live Validation” in ILRP Farm	Min and Max yields, N rates, moisture, unit conflicts, etc.
If orange, something is likely incorrect (some exceptions)	Flag values refined annually

NMP Summary Report Status

Currently there are 3 out of 3 fields completed

Submit the NMP Summary Report

You must submit the Nitrogen Summary Report electronically to the Coalition and you MUST print the Nitrogen Summary Report to keep on-site at your farming operation. Select the submit and print buttons below when your Nitrogen Summary Report is complete.

Member Name Date *ex: mm/dd/yyyy*

Your Nitrogen Summary is Incomplete. You must complete all sections, print your name, date, and submit your evaluation to be complete.

Electronic Submission [Submit NMP Summary]

Print NMP Summary [Printable PDF Report]

[Excel Report] [Refresh page after Saving] Search:

Actions	Field ID	Crop	Field Acres	Duplicate	Total Avail N Applied (lbs/ac)	A/Y	Production Unit/ac	Harvest Moisture (%)	No Yield	Non Bearing	Note
Delete Edit	Alfalfa 1	Alfalfa Hay	0.95		10	0.000000	tons/ac	11%	☐	☐	Note
Delete Edit	Almond 1	Almonds (kernels) -	80		230	0.115000	lbs/ac	N/A	☐	☐	Note
Delete Edit	Pistachios 1	Pistachios (CPC dry yield) -	80		800	0.200000	lbs/ac	N/A	☐	☐	Note

NOTE: Carefully check all orange fields and correct as needed

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

Member ID #: _____ **Member Name:** _____

Was this management unit identified as a statistical outlier by the Coalition last year?
☐ **Yes** ☐ **No**

Crop Year (Harvested): _____

PARCEL MANAGEMENT					
Management Unit (MU) or Field	**APN**	**County**	**Crop**	**Crop Age** (Years)	**Irrigated Acres**
				Total Acres:	

Comments/Notes:

I N M P

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

Member ID: _____ INMP Field or MU: _____ Crop: _____ Total Acres: _____

IRRIGATION MANAGEMENT			
1. Irrigation Method* (check one for Primary; if applicable, check one for Secondary)	Primary	Secondary[1]	**Pre-Season Planning**
	☐	☐	Drip
	☐	☐	Micro Sprinkler
	☐	☐	Furrow
	☐	☐	Sprinkler
	☐	☐	Border Strip
	☐	☐	Flood
2. Crop Evapotranspiration (ET, inches)			
3. Anticipated Crop Irrigation (inches)			
4. Irrigation Water N Concentration (ppm or mg/L, as NO_3-N)			

5. Irrigation Efficiency Practices* (Check all that apply)

- ☐ Laser Leveling
- ☐ Use of ET in scheduling irrigations
- ☐ Water application schedule to need
- ☐ Use of moisture probe (e.g. tensiometer)
- ☐ Soil Moisture Neutron Probe
- ☐ Pressure Bomb
- ☐ Other _____
- ☐ Other _____

HARVEST / YIELD INFORMATION			
Harvest / Yield Information		**Expected (A)**	**Actual (B)**
6. Production Unit (lbs, tons, etc.)		**7. Harvested Yield***	

NITROGEN MANAGEMENT			
8. Nitrogen Efficiency Practices* (Check all that apply)	**Nitrogen Sources**	**Recommended/ Planned N (A)**	**Actual N (B)**
☐ Split Fertilizer Applications	9. Soil – Available N in Root Zone (Annualized, lbs/ac)		
☐ Irrigation Water N Testing	**10. N in Irrigation Water*** (Annualized, lbs/ac)		
☐ Soil Testing	**11. Organic Amendments*** (Manure/Compost/Other, lbs/ac estimate)		
☐ Tissue/Petiole Testing	**12. Dry/Liquid Fertilizer N*** (lbs/ac)		
☐ Fertigation	**13. Foliar Fertilizer N*** (lbs/ac)		
☐ Foliar N Application	14. TOTAL NITROGEN (lbs/ac)		
☐ Cover Crops			
☐ Variable Rate Applications using GPS			
☐ Other: _____			
☐ Other: _____			

[1] A secondary irrigation system could be used for crop germination, frost protection, crop cooling, etc.
***(Bold Text)** Data to be reported to the Coalition on the INMP Summary Report, based on Actual Yield and Actual N.

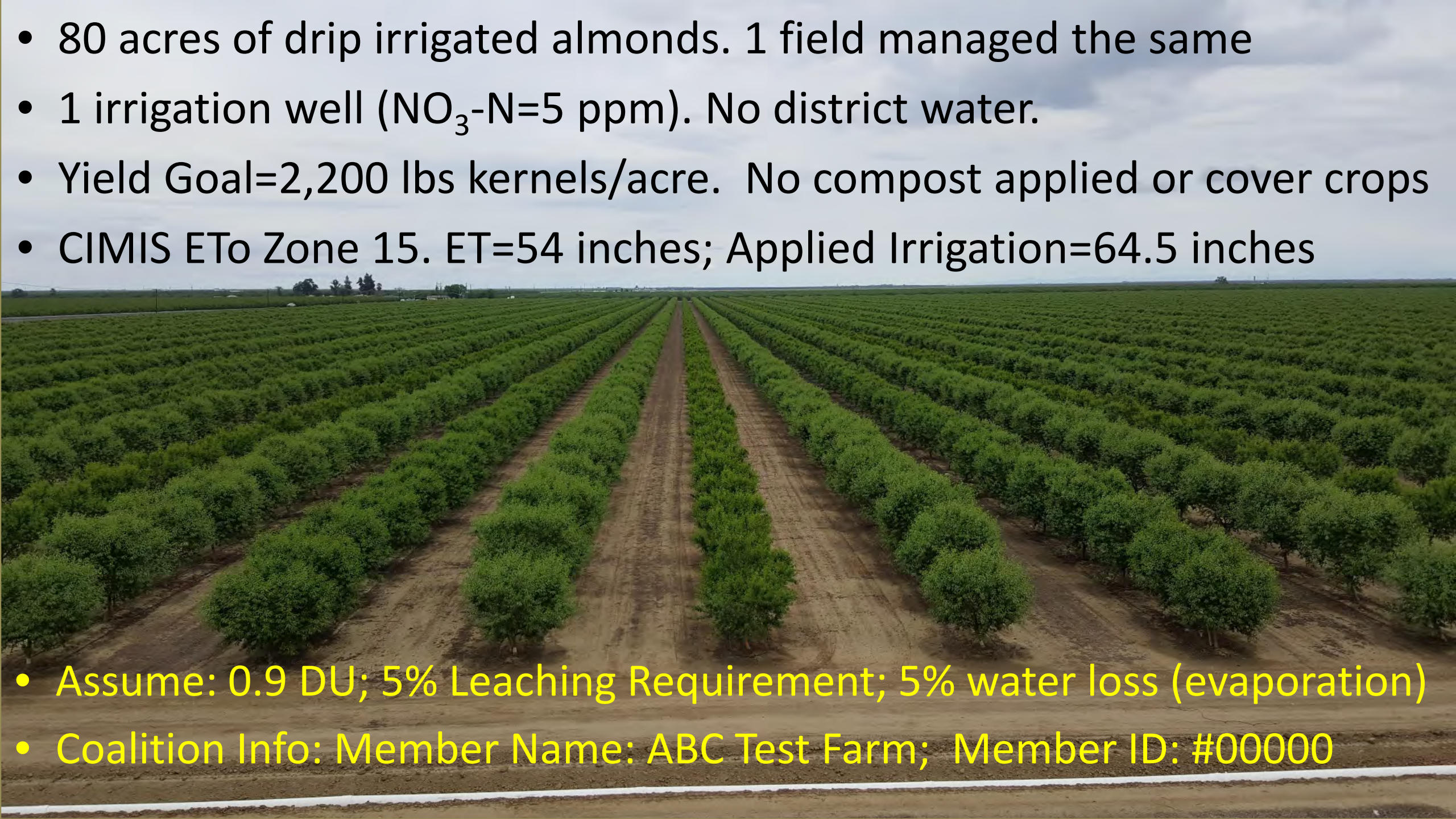
Plan Certifier Initials

INMP Certification Requirements

- **ALL** memberships with at least one High Vulnerability Area (HVA) parcel must certify their INMPs via:
  - *Professionals* listed in the WDR
  - *Grower Self-Certification* (if NMP/INMP Self-Certification course completed)

- Or if you have nitrogen **outlier fields**, as identified in Nitrogen Analysis Reports (NARs) – more info later
- List of Certified Crop Advisers (**CCA**s): https://www.certifiedcropadviser.org/certifications/professional-search/
  - Note that CCAs must have a CDFA nitrogen management specialty certification

- 80 acres of drip irrigated almonds. 1 field managed the same
- 1 irrigation well (NO_3-N=5 ppm). No district water.
- Yield Goal=2,200 lbs kernels/acre. No compost applied or cover crops
- CIMIS ETo Zone 15. ET=54 inches; Applied Irrigation=64.5 inches



- Assume: 0.9 DU; 5% Leaching Requirement; 5% water loss (evaporation)
- Coalition Info: Member Name: ABC Test Farm; Member ID: #00000

INMP Step 3: Basic Member and Field Info

- Complete basic membership and year information
- Note important assumptions

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

Member ID #: 00000 **Member Name:** ABC Test Farm

Was this management unit identified as a statistical outlier by the Coalition last year?
☐ Yes ☑ No

Crop Year (Harvested): 2020

PARCEL MANAGEMENT

Management Unit (MU) or Field	APN	County	Crop	Crop Age (Years)	Irrigated Acres
Almond 1	002-002-02	Kern	Almonds	10	80
				Total Acres:	80

Comments/Notes:

-All 80 acres managed the same.
-One irrigation well (NO3-N=5 ppm from ag lab); No district water.
-CIMIS ETo Zone 15. Crop ET from Almond Irrigation Improvement Continuum.
-Assuming steady state soil nitrogen conditions.
-Nitrogen Use Efficiency (NUE)=70%.
-Nitrogen Removed 68 lbs N/1000 lbs kernels = 25 lbs/acre for tree growth
-Assumed Distribution Uniformity=0.9; no runoff.
-Assumed Leaching Requirement=5%.

INMP Step 4: ETo Estimates - CIMIS

Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1	0.93	1.40	2.48	3.30	4.03	4.50	4.65	4.03	3.30	2.48	1.20	0.62	32.9
2	1.24	1.68	3.10	3.90	4.65	5.10	4.96	4.65	3.90	2.79	1.80	1.24	39.0
3	1.86	2.24	3.72	4.80	5.27	5.70	5.58	5.27	4.20	3.41	2.40	1.86	46.3
4	1.86	2.24	3.41	4.50	5.27	5.70	5.89	5.58	4.50	3.41	2.40	1.86	46.6
5	0.93	1.68	2.79	4.20	5.58	6.30	6.51	5.89	4.50	3.10	1.50	0.93	43.9
6	1.86	2.24	3.41	4.80	5.58	6.30	6.51	6.20	4.80	3.72	2.40	1.86	49.7
7	0.62	1.40	2.48	3.90	5.27	6.30	7.44	6.51	4.80	2.79	1.20	0.62	43.3
8	1.24	1.68	3.41	4.80	6.20	6.90	7.44	6.51	5.10	3.41	1.80	0.93	49.4
9	2.17	2.80	4.03	5.10	5.89	6.60	7.44	6.82	5.70	4.03	2.70	1.86	55.1
10	0.93	1.68	3.10	4.50	5.89	7.20	8.06	7.13	5.10	3.10	1.50	0.93	49.1
11	1.55	2.24	3.10	4.50	5.89	7.20	8.06	7.44	5.70	3.72	2.10	1.55	53.1
12	1.24	1.96	3.41	5.10	6.82	7.80	8.06	7.13	5.40	3.72	1.80	0.93	53.4
13	1.24	1.96	3.10	4.80	6.51	7.80	8.99	7.75	5.70	3.72	1.80	0.93	54.3
14	1.55	2.24	3.72	5.10	6.82	7.80	8.68	7.75	5.70	4.03	2.10	1.55	57.0
15	1.24	2.24	3.72	5.70	7.44	8.10	8.68	7.75	5.70	4.03	2.10	1.24	57.9
16	1.55	2.52	4.03	5.70	7.75	8.70	9.30	8.37	6.30	4.34	2.40	1.55	62.5
17	1.86	2.80	4.65	6.00	8.06	9.00	9.92	8.68	6.60	4.34	2.70	1.86	66.5
18	2.48	3.36	5.27	6.90	8.68	9.60	9.61	8.68	6.90	4.96	3.00	2.17	71.6

https://www.almonds.com/sites/default/files/Almond-Irrigation-Improvement-Continuum.pdf

INMP Step 4: ETo and ETC Estimates

https://www.almonds.com/sites/default/files/Almond-Irrigation-Improvement-Continuum.pdf

	Kc[3]	Zone 12[4]		Zone 14[5]		Zone 15[6]		Zone 16[7]	
		ETo	ETc	ETo	ETc	ETo	ETc	ETo	ETc
Jan 1-15	0.40	0.54	0.22	0.74	0.29	0.56	0.23	0.72	0.29
Jan 16-31	0.40	0.74	0.30	0.87	0.35	0.76	0.30	0.92	0.37
Feb 1-15	0.41	0.86	0.35	0.99	0.41	0.97	0.40	1.10	0.45
Feb 16-28	0.41	0.96	0.39	1.09	0.45	1.09	0.45	1.22	0.50
Mar 1-15	0.62	1.44	0.89	1.61	1.00	1.59	0.99	1.75	1.09
Mar 16-31	0.62	1.97	1.22	2.10	1.30	2.16	1.34	2.29	1.42
Apr 1-15	0.80	2.26	1.81	2.30	1.84	2.51	2.01	2.54	2.03
Apr 16-30	0.80	2.69	2.15	2.68	2.14	3.00	2.40	3.01	2.41
May 1-15	0.94	3.12	2.94	3.12	2.93	3.45	3.24	3.54	3.33
May 16-31	0.94	3.72	3.50	3.71	3.49	4.01	3.77	4.21	3.96
Jun 1-15	1.05	3.74	3.92	3.71	3.90	3.91	4.10	4.18	4.39
Jun 16-30	1.05	3.89	4.09	3.94	4.14	4.06	4.26	4.36	4.58
July 1-15	1.11	3.97	4.41	4.19	4.65	4.22	4.68	4.53	5.03
July 16-31	1.11	4.18	4.64	4.54	5.04	4.53	5.03	4.85	5.38
Aug 1-15	1.11	3.70	4.11	4.04	4.48	4.03	4.48	4.33	4.81
Aug 16-31	1.11	3.56	3.95	3.84	4.27	3.85	4.27	4.18	4.64
Sept 1-15	1.06	2.89	3.06	3.07	3.25	3.07	3.26	3.38	3.58
Sept 16-30	1.06	2.47	2.62	2.61	2.77	2.61	2.77	2.88	3.05
Oct 1-15	0.92	2.08	1.92	2.23	2.05	2.23	2.05	2.42	2.22
Oct 16-31	0.92	1.73	1.59	1.89	1.73	1.89	1.74	2.04	1.88
Nov 1-15	0.69	1.12	0.77	1.25	0.87	1.27	0.87	1.41	0.97
Nov 16-30	0.69	0.73	0.51	0.92	0.63	0.89	0.61	1.04	0.72
Dec 1-15	0.43	0.52	0.22	0.79	0.34	0.69	0.29	0.84	0.36
Dec 16-31	0.43	0.49	0.21	0.79	0.34	0.61	0.26	0.77	0.33
Totals (in.)									
Yearly			49.78		52.67		53.80		57.78
Crop season[8]			47.59		49.85		51.25		54.77
Non-crop season[9]			2.20		2.81		2.54		3.02

Table 1. Thirty-year average evapotranspiration reference rates (ETo)[1] and almonds (ETc)[2] for selected CIMIS zones in almond-producing areas of California.

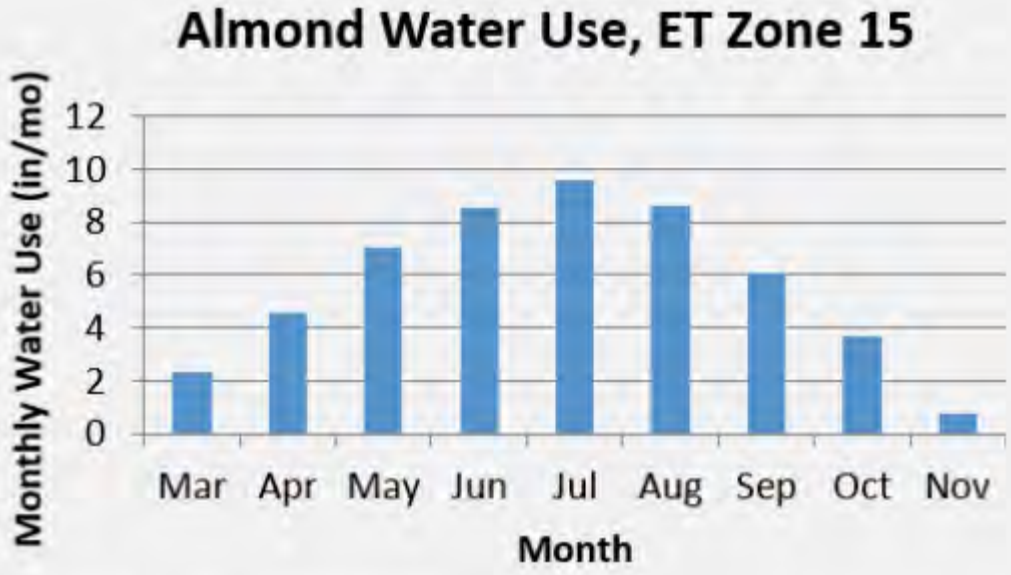


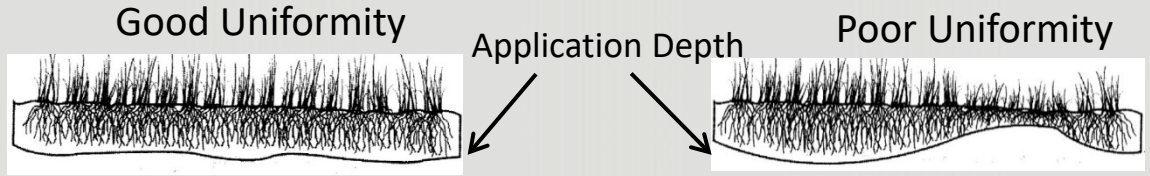
Figure 2. Monthly almond water use by a mature orchard with no cover crop and no significant water stress in climate zone 15 (Bakersfield to Los Banos), one of the four major climatic zones where California almonds are grown.

ETc = ETo x Kc

- ETc = Potential Crop Water Use
- ETo = Reference ET
- Kc = Crop Coefficient

INMP Step 4: Example Irrigation Requirements - Almonds

- POTENTIAL Crop evapotranspiration (**ETc**) = Reference **ETo** x Crop coefficient (**Kc**)
- CIMIS Zone 15 ETc = ~54 inches



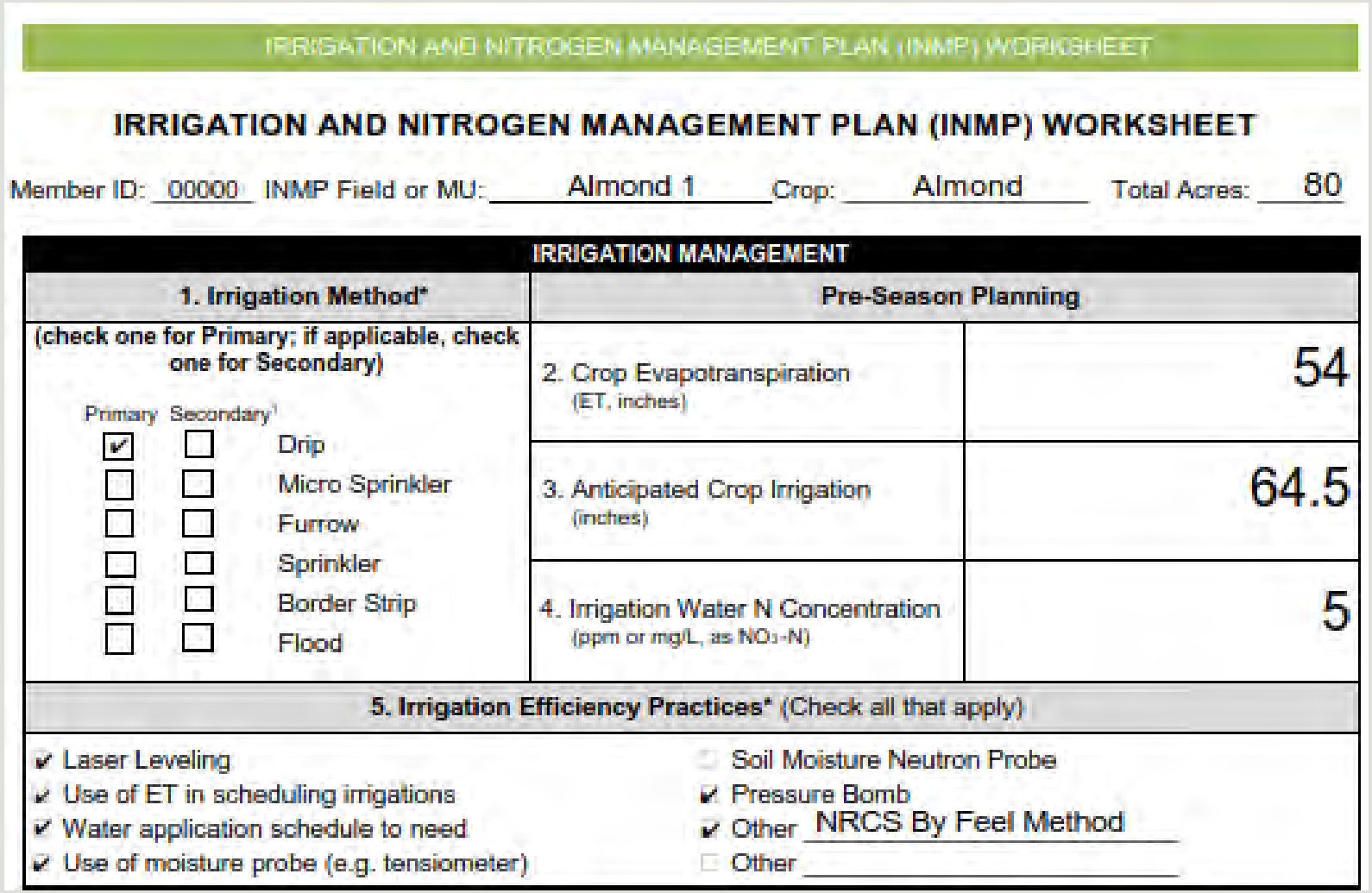
- ETc must be adjusted for efficiency and other factors
- $Gross\ Irrigation\ Requirement = \frac{Potential\ ETc}{DU\ x\ (1-losses) x\ (1-LR)}$ - effective rainfall
- Terms: **DU** = distribution uniformity (90%); **LR** = Leaching Requirement (5%); losses = evaporative losses and runoff (5%); effective rainfall (2 inches)
- $Gross\ Irrigation = \frac{54\ inches}{0.9\ x\ (1-0.05)\ x\ (1-0.05)}$ - 2 inches = **64.5 inches**

[~81%]

Summary: Irrigation plan: Apply ~64.5 inches to achieve net of 54 inches + other factors

INMP Step 4: Irrigation Management Items

- Fill out basic info (e.g. Member ID)
- Answer survey questions
- Enter ET and water quality #s



IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

Member ID: 00000 INMP Field or MU: Almond 1 Crop: Almond Total Acres: 80

IRRIGATION MANAGEMENT		
1. Irrigation Method*	**Pre-Season Planning**	
(check one for Primary; if applicable, check one for Secondary)	2. Crop Evapotranspiration (ET, inches)	54
Primary / Secondary[1]: ☑ / ☐ Drip; ☐ / ☐ Micro Sprinkler; ☐ / ☐ Furrow; ☐ / ☐ Sprinkler; ☐ / ☐ Border Strip; ☐ / ☐ Flood	3. Anticipated Crop Irrigation (inches)	64.5
	4. Irrigation Water N Concentration (ppm or mg/L, as NO_3-N)	5

5. Irrigation Efficiency Practices* (Check all that apply)

- ☑ Laser Leveling
- ☑ Use of ET in scheduling irrigations
- ☑ Water application schedule to need
- ☑ Use of moisture probe (e.g. tensiometer)
- ☐ Soil Moisture Neutron Probe
- ☑ Pressure Bomb
- ☑ Other NRCS By Feel Method
- ☐ Other _____

INMP Step 5: Review Previous Year's Nitrogen Analysis Reports (NARs)

October 8, 2019

NOT submitted to the Regional Board

ILRP NITROGEN ANALYSIS REPORT (NAR)

Kern River Watershed Coalition Authority (KRWCA)

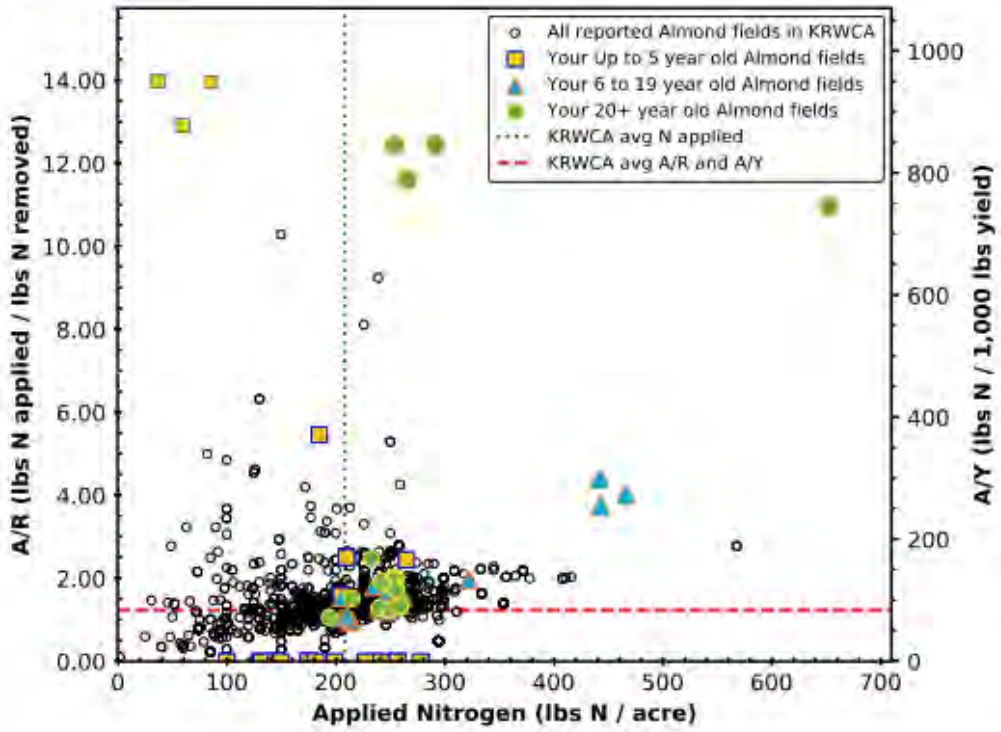
Crop/Harvest Year 2018 **Member ID:** xxxxx **Member Name:** Sample

Summary and analysis of your Nitrogen Management Plan (NMP) Summary Report

A summary and analysis of your submitted nitrogen (N) information is provided below. Note that the units for the ratio of N applied over crop yield (A/Y) have been converted to pounds (lbs) of N applied over 1,000 pounds of crop yield, which will not match the information you submitted.

The scatterplot(s) below illustrates the relationship between total N applied and the ratios of N applied over N removed (A/R) and A/Y for all reported and bearing fields in the KRWCA and your fields by crop. As defined in the graph legend, your fields are illustrated as colored symbols, and all other reported fields in the KRWCA are illustrated with **black circles**. The **horizontal red line** is the average A/R and A/Y for all reported and yielding data for the specified crop. The **vertical green line** shows the average N application rate. In general, fields that are lower on the vertical axis of the graph were likely more efficient with their N management than fields higher on the graph. Fields to the right of the green line applied more N than fields to the left. Note that these lines are only averages and do not represent limits, regulatory thresholds, or recommendations.

Crop: Almonds



The black circles in the graph above represent all producing and harvested fields of the crop in the KRWCA. Any non-bearing (NB) or no yield (NY) fields that you may have may appear with A/R and A/Y rates of zero for comparison of nitrogen application rates only. A/R values above 15 and A/Y values above 5,000 may not be shown in the graph above or rates display the data, but all data are included in averages shown in the graph and tables.

Crop/Harvest Year: 2018 **Member ID:** xxxxx **Member Name:** Sample

Field ID	Primary APN	Age Category	Field Acres	Total N Applied lbs/ac	A/Y lbs N/1,000 lbs yield	Est. N Removed lbs/ac	A/R N App/N Rem
111	xxx-xxx-xx	Up to 5 years	36	205	71	197	1.04
222	xxx-xxx-xx	Up to 5 years	110	215	66	221	0.97
111x	xxx-xxx-xx	6 to 19 years	95	215	66	221	0.97
5555	xxx-xxx-xx	6 to 19 years	114	450	225	136	3.31
abcd	xxx-xx-xxx	20+ years	38	233	168	94	2.47
12345678	xxx-xxx-xx	20+ years	58	255	137	127	2.01
ABCD25	xxx-xx-xx	20+ years	56	255	137	127	2.01
FOOT1	xxx-xxx-xx	20+ years	47.5	254	134	129	1.97
Total Field Acres:			5,000.00	--	--	--	--

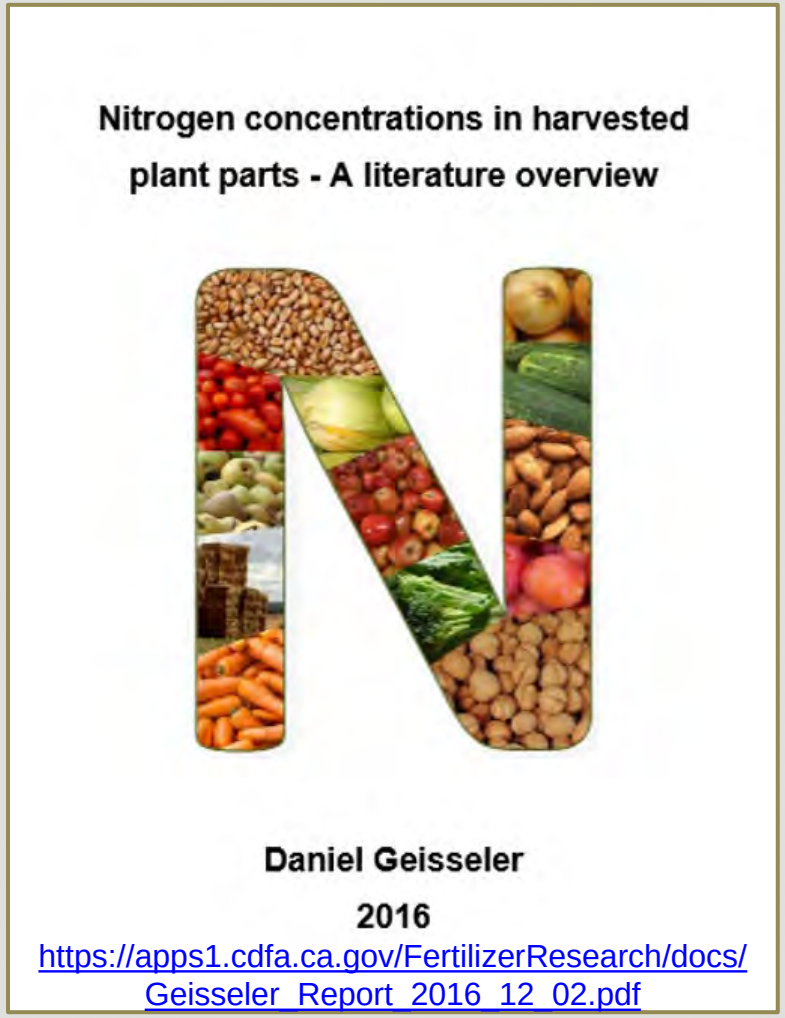
KRWCA Averages by Age Category		Total N Applied lbs/ac	A/Y lbs N/1,000 lbs yield	Est. N Removed lbs/ac	A/R N App/N Removed
Up to 5 Years	Your Average:	220	157	104	2.31
	KRWCA Average:	155	80	132	1.17
6 to 19 years	Your Average:	250	104	170	1.52
	KRWCA Average:	225	84	182	1.23
20+ years	Your Average:	245	121	142	1.78
	KRWCA Average:	185	91	139	1.33
Overall Averages of All Reported Fields	Your Average:	235	130	140	1.60
	KRWCA Average:	209	84	168	1.24

* All averages are acreage-weighted averages.

INMP Step 6: Nitrogen Removal Coefficients

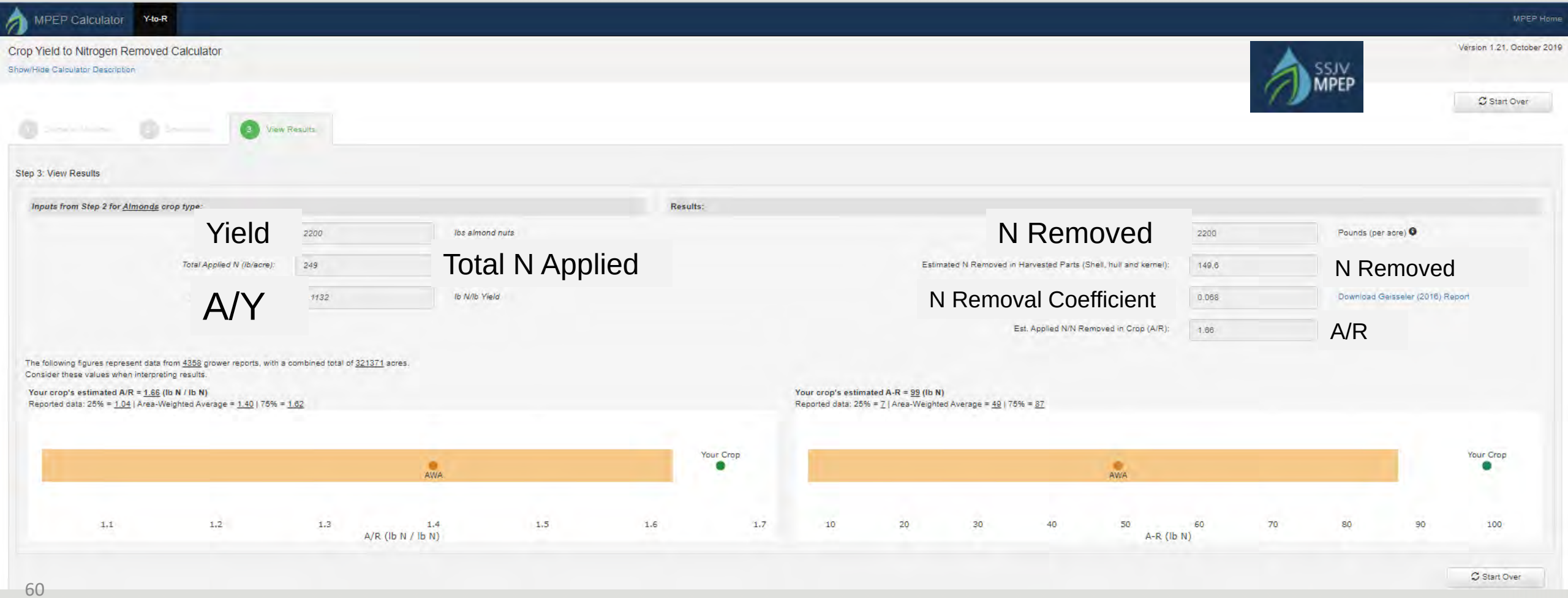
- Dr. Daniel Geisseler, Extension Specialist – UCCE LAWR
  - Will be consistently refined
  - Current grand-funded project ongoing

- Can also get information on N removal from the **MPEP** website:
  - http://agmpep.com/calc-y2r/



INMP Step 6: MPEP Yield to Nitrogen Removed Calculator

www.agmpep.com/calc-y2r/



INMP Step 6: Overall Nitrogen Requirement

Approximately **68** lbs N are removed per 1,000 lbs of kernels + ~**25** lbs N/acre for *perennial tissues*

(https://apps1.cdfa.ca.gov/FertilizerResearch/docs/Almonds.html)

[1] $$\frac{lbs\ N\ removed}{acre} = \frac{2200\ \cancel{\text{lbs kernels}}}{\text{acre}} \times \frac{68\ \text{lbs N removed}}{1{,}000\ \cancel{\text{lbs kernels}}} = \boxed{\frac{149.6\ \text{lbs N removed}}{\text{acre}}}$$

Removed via harvest and removal of hull, shells, and kernels

[2] $$\frac{149.6\ \text{lbs N}}{\text{acre}} + \frac{25\ \text{lbs N}}{\text{acre}} = \boxed{\frac{174.6\ \text{lbs N}}{\text{acre}}}$$

Scale up for perennial growth (roots, trunk, branches)

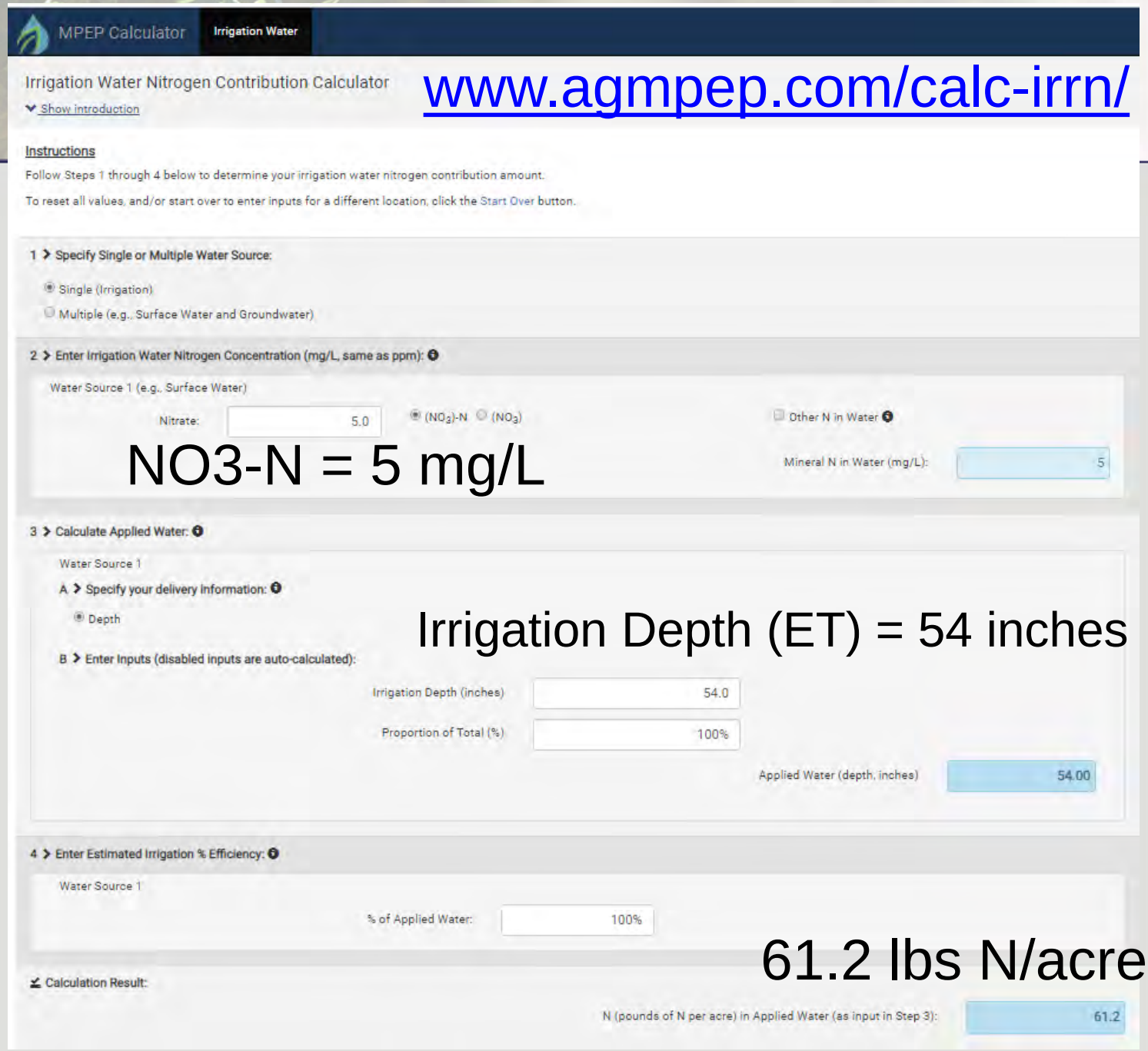
[3] $$\frac{174.6\ lbs\ N}{ac} \div 0.7\ \text{NUE} = \boxed{\frac{249\ \text{lbs N}}{\text{ac}}}$$

Adjust for nitrogen use efficiency (NUE) of 70%

NITROGEN MANAGEMENT		
Nitrogen Sources	**Recommended/ Planned N (A)**	**Actual N (B)**
9. Soil – Available N in Root Zone (Annualized, lbs/ac)		
10. N in Irrigation Water* (Annualized, lbs/ac)		
11. Organic Amendments* (Manure/Compost/Other, lbs/ac estimate)		
12. Dry/Liquid Fertilizer N* (lbs/ac)		
13. Foliar Fertilizer N* (lbs/ac)		
14. TOTAL NITROGEN (lbs/ac)	249	

INMP Step 7: Credit (Nitrogen from Irrigation Water)

1. agmpep.com > NMP > Irrigation N Calculator
2. Enter values into calculator
    1. NO3-N= 5 PPM; ET=54 inches = **61 lbs N/acre**
3. Or, use manual formula:
    1. 54 inches x 5 ppm x 0.227 = **61 lbs N/acre**



INMP Step 8: Determine Fertilizer Rate

- Need **249** lbs N/acre
- No soil or organic amendment N
- **61** lbs N/acre from irrigation
- Last step: calculate N fertilization requirement to make up the difference:
- 249-(0+61+0) = **188** lbs N/acre
- Apply **178** lbs N/acre with liquid fertilizer (e.g. UN-32)
- Apply **10** lbs N/acre via foliar spray (e.g. low-biuret urea)

NITROGEN MANAGEMENT		
Nitrogen Sources	**Recommended/ Planned N (A)**	**Actual N (B)**
9. Soil – Available N in Root Zone (Annualized, lbs/ac)	0	
10. N in Irrigation Water* (Annualized, lbs/ac)	61	
11. Organic Amendments* (Manure/Compost/Other, lbs/ac estimate)	0	
12. Dry/Liquid Fertilizer N* (lbs/ac)	**178**	
13. Foliar Fertilizer N* (lbs/ac)	**10**	
14. TOTAL NITROGEN (lbs/ac)	249	

NOTE: Ensure rows 9-13 equal row 14!!

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

Member ID #: 00000 **Member Name:** ABC Test Farm

Was this management unit identified as a statistical outlier by the Coalition last year?
☐ Yes ☑ No

Crop Year (Harvested): 2020

PARCEL MANAGEMENT

Management Unit (MU) or Field	APN	County	Crop	Crop Age (Years)	Irrigated Acres
Almond 1	002-002-02	Kern	Almonds	10	80
				Total Acres:	80

Comments/Notes:

-All 80 acres managed the same.
-One irrigation well (NO3-N=5 ppm from ag lab); No district water.
-CIMIS ETo Zone 15. Crop ET from Almond Irrigation Improvement Continuum.
-Assuming steady state soil nitrogen conditions.
-Nitrogen Use Efficiency (NUE)=70%.
-Nitrogen Removed 68 lbs N/1000 lbs kernels = 25 lbs/acre for tree growth
-Assumed Distribution Uniformity=0.9; no runoff.
-Assumed Leaching Requirement=5%.

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

Member ID: 00000 INMP Field or MU: Almond 1 Crop: Almond Total Acres: 80

IRRIGATION MANAGEMENT

1. Irrigation Method* (check one for Primary; if applicable, check one for Secondary)	Primary	Secondary[1]
Drip	☑	☐
Micro Sprinkler	☐	☐
Furrow	☐	☐
Sprinkler	☐	☐
Border Strip	☐	☐
Flood	☐	☐

Pre-Season Planning	
2. Crop Evapotranspiration (ET, inches)	54
3. Anticipated Crop Irrigation (inches)	64.5
4. Irrigation Water N Concentration (ppm or mg/L, as NO_3-N)	5

5. Irrigation Efficiency Practices* (Check all that apply)

- ☑ Laser Leveling
- ☑ Use of ET in scheduling irrigations
- ☑ Water application schedule to need
- ☑ Use of moisture probe (e.g. tensiometer)
- ☐ Soil Moisture Neutron Probe
- ☑ Pressure Bomb
- ☑ Other NRCS By Feel Method
- ☐ Other

HARVEST / YIELD INFORMATION

Harvest / Yield Information			Expected (A)	Actual (B)
6. Production Unit (lbs, tons, etc.)	pounds	7. Harvested Yield*	2200	

NITROGEN MANAGEMENT

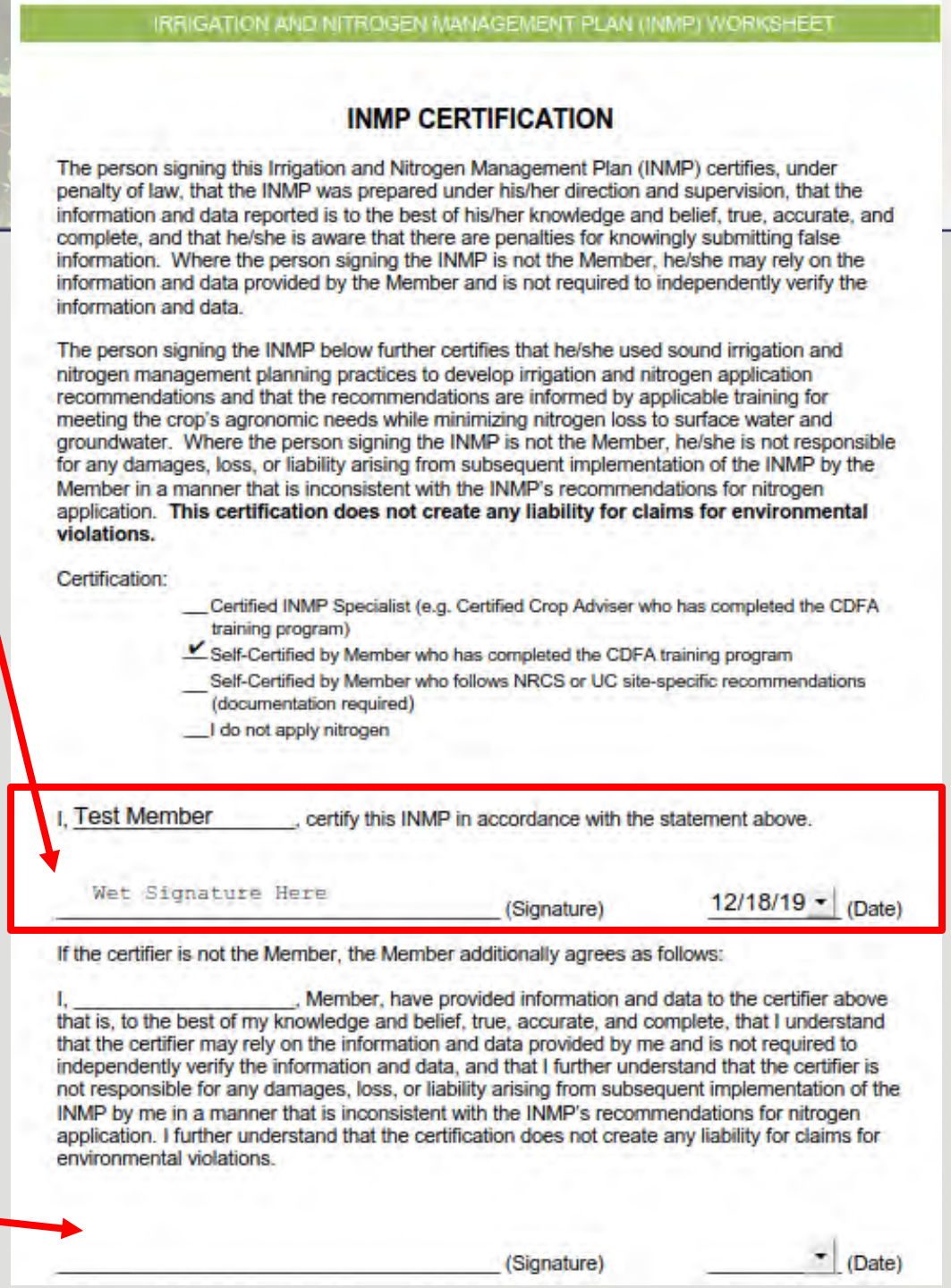
8. Nitrogen Efficiency Practices* (Check all that apply)	Nitrogen Sources	Recommended/ Planned N (A)	Actual N (B)
☑ Split Fertilizer Applications	9. Soil – Available N in Root Zone (Annualized, lbs/ac)	0	
☑ Irrigation Water N Testing	**10. N in Irrigation Water*** (Annualized, lbs/ac)	61	
☑ Soil Testing	**11. Organic Amendments*** (Manure/Compost/Other, lbs/ac estimate)	0	
☑ Tissue/Petiole Testing	**12. Dry/Liquid Fertilizer N*** (lbs/ac)	178	
☑ Fertigation	**13. Foliar Fertilizer N*** (lbs/ac)	10	
☑ Foliar N Application	14. TOTAL NITROGEN (lbs/ac)	249	
☐ Cover Crops			
☐ Variable Rate Applications using GPS			
☑ Other: Nutrient Mgmt Plan			
☑ Other: Early season N model			

[1] A secondary irrigation system could be used for crop germination, frost protection, crop cooling, etc.
***(Bold Text)** Data to be reported to the Coalition on the INMP Summary Report, based on Actual Yield and Actual N.

Plan Certifier Initials: tmm

INMP Step 9: Certification

- If required, certifier must sign here:
- If a CCA certifies, grower also signs here:



IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

INMP CERTIFICATION

The person signing this Irrigation and Nitrogen Management Plan (INMP) certifies, under penalty of law, that the INMP was prepared under his/her direction and supervision, that the information and data reported is to the best of his/her knowledge and belief, true, accurate, and complete, and that he/she is aware that there are penalties for knowingly submitting false information. Where the person signing the INMP is not the Member, he/she may rely on the information and data provided by the Member and is not required to independently verify the information and data.

The person signing the INMP below further certifies that he/she used sound irrigation and nitrogen management planning practices to develop irrigation and nitrogen application recommendations and that the recommendations are informed by applicable training for meeting the crop's agronomic needs while minimizing nitrogen loss to surface water and groundwater. Where the person signing the INMP is not the Member, he/she is not responsible for any damages, loss, or liability arising from subsequent implementation of the INMP by the Member in a manner that is inconsistent with the INMP's recommendations for nitrogen application. **This certification does not create any liability for claims for environmental violations.**

Certification:

__ Certified INMP Specialist (e.g. Certified Crop Adviser who has completed the CDFA training program)
✔ Self-Certified by Member who has completed the CDFA training program
__ Self-Certified by Member who follows NRCS or UC site-specific recommendations (documentation required)
__ I do not apply nitrogen

I, Test Member, certify this INMP in accordance with the statement above.

Wet Signature Here (Signature) 12/18/19 (Date)

If the certifier is not the Member, the Member additionally agrees as follows:

I, _____, Member, have provided information and data to the certifier above that is, to the best of my knowledge and belief, true, accurate, and complete, that I understand that the certifier may rely on the information and data provided by me and is not required to independently verify the information and data, and that I further understand that the certifier is not responsible for any damages, loss, or liability arising from subsequent implementation of the INMP by me in a manner that is inconsistent with the INMP's recommendations for nitrogen application. I further understand that the certification does not create any liability for claims for environmental violations.

_____ (Signature) _____ (Date)

INMP Step 11: Actual Column

- **Actual yield slightly lower** than goal
- Applied **less irrigation water** than anticipated, so **less N applied**
- Adjusted fertilizer rates accordingly
- Copy bolded “actual” rows to **INMP Summary Report**
- Enter NMP SR values into **ILRP Farm**

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

Member ID: 00000 INMP Field or MU: Almond 1 Crop: Almond Total Acres: 80

IRRIGATION MANAGEMENT

1. Irrigation Method* (check one for Primary; if applicable, check one for Secondary)			Pre-Season Planning	
Primary	Secondary[1]			
☑	☐	Drip	2. Crop Evapotranspiration (ET, inches)	54
☐	☐	Micro Sprinkler	3. Anticipated Crop Irrigation (inches)	64.5
☐	☐	Furrow		
☐	☐	Sprinkler		
☐	☐	Border Strip	4. Irrigation Water N Concentration (ppm or mg/L, as NO_3-N)	5
☐	☐	Flood		

5. Irrigation Efficiency Practices* (Check all that apply)

- ☑ Laser Leveling
- ☑ Use of ET in scheduling irrigations
- ☑ Water application schedule to need
- ☑ Use of moisture probe (e.g. tensiometer)
- ☐ Soil Moisture Neutron Probe
- ☑ Pressure Bomb
- ☑ Other NRCS By Feel Method
- ☐ Other

HARVEST / YIELD INFORMATION

Harvest / Yield Information			Expected (A)	Actual (B)
6. Production Unit (lbs, tons, etc.)	pounds	7. Harvested Yield*	2200	2000

NITROGEN MANAGEMENT

8. Nitrogen Efficiency Practices* (Check all that apply)	Nitrogen Sources	Recommended/ Planned N (A)	Actual N (B)
☑ Split Fertilizer Applications	9. Soil – Available N in Root Zone (Annualized, lbs/ac)	0	0
☑ Irrigation Water N Testing	**10. N in Irrigation Water*** (Annualized, lbs/ac)	61	50
☑ Soil Testing	**11. Organic Amendments*** (Manure/Compost/Other, lbs/ac estimate)	0	0
☑ Tissue/Petiole Testing	**12. Dry/Liquid Fertilizer N*** (lbs/ac)	178	170
☑ Fertigation	**13. Foliar Fertilizer N*** (lbs/ac)	10	10
☑ Foliar N Application	14. TOTAL NITROGEN (lbs/ac)	249	230
☐ Cover Crops			
☐ Variable Rate Applications using GPS			
☑ Other: Nutrient Mgmt Plan			
☑ Other: Early season N model			

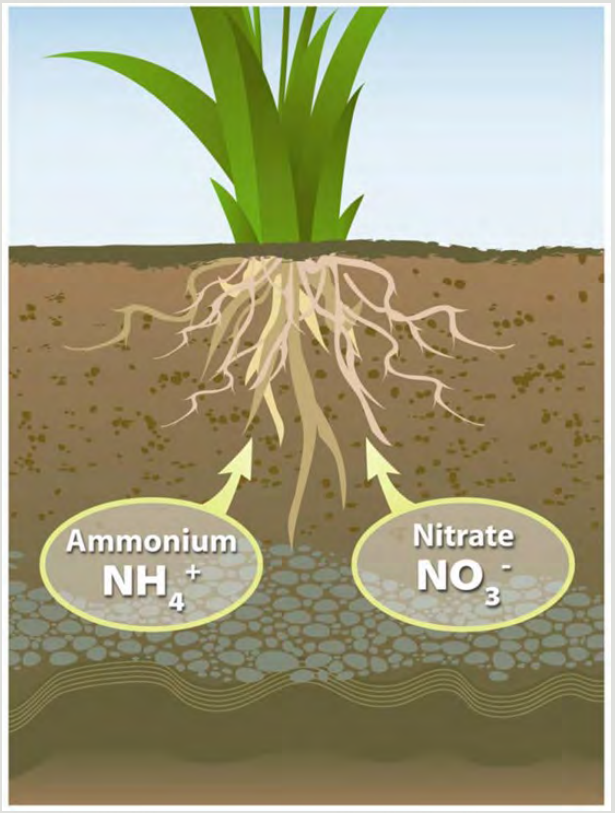
[1] A secondary irrigation system could be used for crop germination, frost protection, crop cooling, etc.
*(Bold Text) Data to be reported to the Coalition on the INMP Summary Report, based on Actual Yield and Actual N.

Plan Certifier Initials: tmm

Nitrogen Analysis Reports (NARs)

What is A/R and A-R?

- **A** = Total **applied** nitrogen
  - (Box 20+23 of old NMP)
- **R** = Nitrogen **removed** from the field + sequestered in permanent tissue
- Metrics used for nitrogen use **efficiency**
- Possible future **regulatory metric**
  - For example, Dairy General Order A/R limit of 1.4 to 1.65
- Appropriate ranges not yet established, but coalitions now have three years of data on reported A and R values. *Some regulatory limits will likely be developed.*



Nitrogen Analysis Reports (NARs) Overview

October 8, 2019

NOT submitted to the Regional Board

ILRP NITROGEN ANALYSIS REPORT (NAR)

Kern River Watershed Coalition Authority (KRWCA)

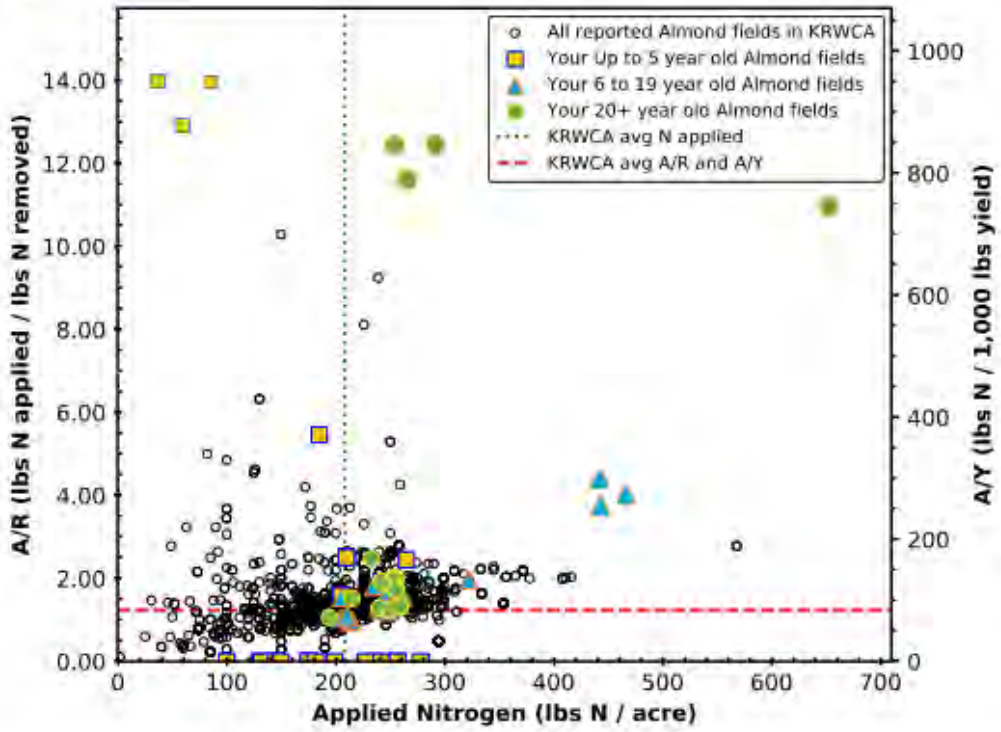
Crop/Harvest Year 2018 **Member ID:** xxxxx **Member Name:** Sample

Summary and analysis of your Nitrogen Management Plan (NMP) Summary Report

A summary and analysis of your submitted nitrogen (N) information is provided below. Note that the units for the ratio of N applied over crop yield (A/Y) have been converted to pounds (lbs) of N applied over 1,000 pounds of crop yield, which will not match the information you submitted.

The scatterplot(s) below illustrates the relationship between total N applied and the ratios of N applied over N removed (A/R) and A/Y for all reported and bearing fields in the KRWCA and your fields by crop. As defined in the graph legend, your fields are illustrated as colored symbols, and all other reported fields in the KRWCA are illustrated with **black circles**. The **horizontal red line** is the average A/R and A/Y for all reported and yielding data for the specified crop. The **vertical green line** shows the average N application rate. In general, fields that are lower on the vertical axis of the graph were likely more efficient with their N management than fields higher on the graph. Fields to the right of the green line applied more N than fields to the left. Note that these lines are only averages and do not represent limits, regulatory thresholds, or recommendations.

Crop: Almonds



The black circles in the graph above represent all producing and harvested fields of the crop in the KRWCA. Any non-bearing (NB) or no yield (NY) fields that you may have (listed with A/R and A/Y rates of zero for comparison of nitrogen application rates only). A/R values above 15 and A/Y values above 5,000 may not be shown in the graph above or rates display the data, but all data are included in averages shown in the graph and tables.

Crop/Harvest Year: 2018 **Member ID:** xxxxx **Member Name:** Sample

Field ID	Primary APN	Age Category	Field Acres	Total N Applied lbs/ac	A/Y lbs N/1,000 lbs yield	Est. N Removed lbs/ac	A/R N App/N Rem
111	xxx-xxx-xx	Up to 5 years	36	205	71	197	1.04
222	xxx-xxx-xx	Up to 5 years	110	215	66	221	0.97
111x	xxx-xxx-xx	6 to 19 years	95	215	66	221	0.97
5555	xxx-xxx-xx	6 to 19 years	114	450	225	136	3.31
abcd	xxx-xx-xxx	20+ years	38	233	168	94	2.47
12345678	xxx-xxx-xx	20+ years	58	255	137	127	2.01
ABCD25	xxx-xx-xx	20+ years	56	255	137	127	2.01
FOOT1	xxx-xxx-xx	20+ years	47.5	254	134	129	1.97
Total Field Acres:			5,000.00	--	--	--	--

KRWCA Averages by Age Category		Total N Applied lbs/ac	A/Y lbs N/1,000 lbs yield	Est. N Removed lbs/ac	A/R N App/N Removed
Up to 5 Years	Your Average:	220	157	104	2.31
	KRWCA Average:	155	80	132	1.17
6 to 19 years	Your Average:	250	104	170	1.52
	KRWCA Average:	225	84	182	1.23
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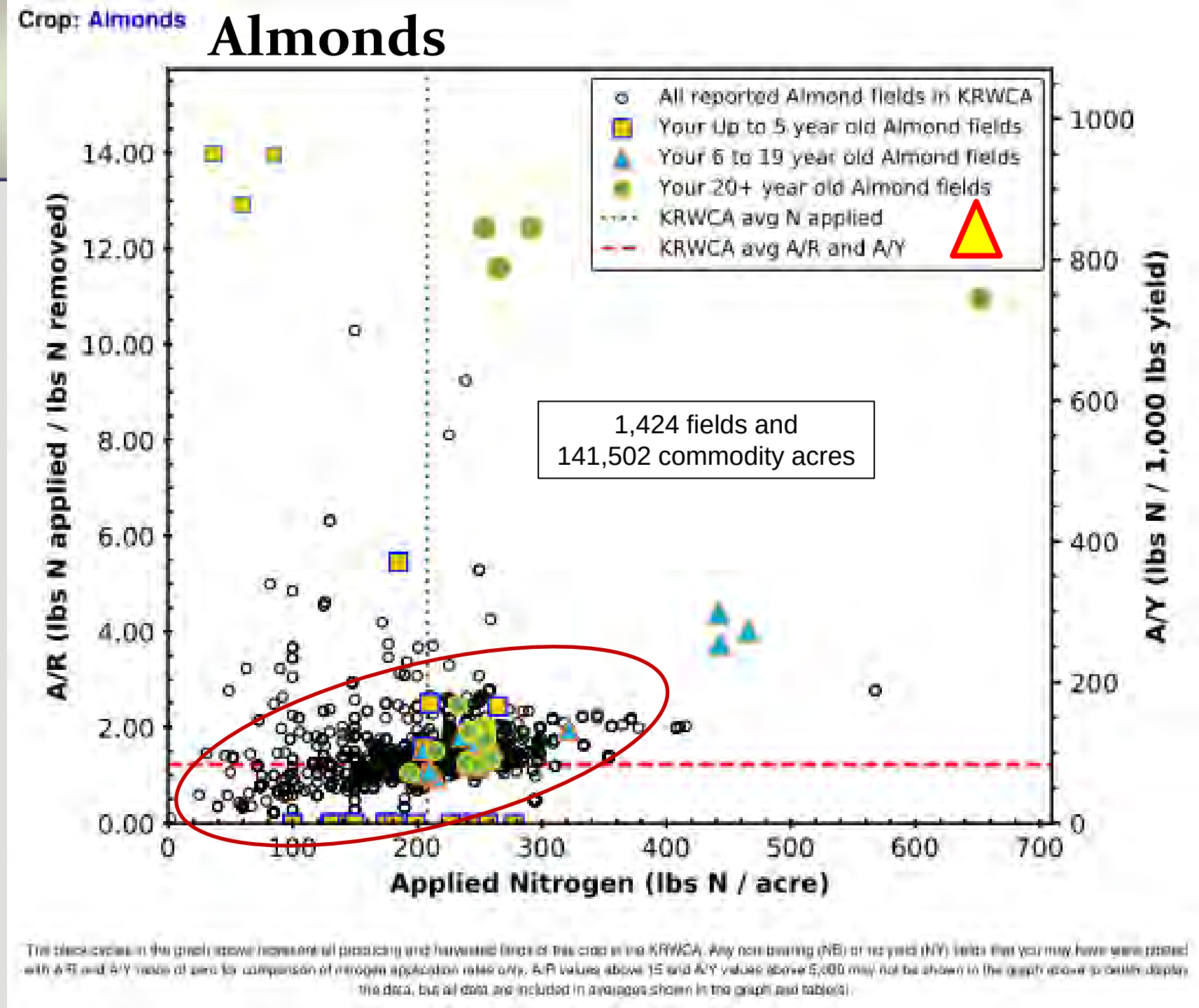
Overall Averages of All Reported Fields	Your Average:	235	130	140	1.60
	KRWCA Average:	209	84	168	1.24

* All averages are acreage-weighted averages.

NAR Graph


Crop: Almonds
Almonds
All reported Almond fields in KRWCA
Your Up to 5 year old Almond fields
Your 6 to 19 year old Almond fields
Your 20+ year old Almond fields
KRWCA avg N applied
KRWCA avg A/R and A/Y
1,424 fields and
141,502 commodity acres
A/R (lbs N applied / lbs N removed)
A/Y (lbs N / 1,000 lbs yield)
Applied Nitrogen (lbs N / acre)
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
0
200
400
600
800
1000
0
100
200
300
400
500
600
700

NAR Table

Crop/Harvest Year: 2018 **Member ID:** xxxxx **Member Name:** Sample

Field ID	Primary APN	Age Category	Field Acres	Total N Applied lbs/ac	A/Y lbs N/1,000 lbs yield	Est. N Removed lbs/ac	A/R N App/N Rem
111	xxx-xxx-xx	Up to 5 years	36	205	71	197	1.04
222	xxx-xxx-xx	Up to 5 years	110	215	66	221	0.97
111x	xxx-xxx-xx	6 to 19 years	95	215	66	221	0.97
5555	xxx-xxx-xx	6 to 19 years	114	450	225	136	3.31
abcd	xxx-xx-xxx	20+ years	38	233	168	94	2.47
12345678	xxx-xxx-xx	20+ years	58	255	137	127	2.01
ABCD25	xxx-xx-xx	20+ years	56	255	137	127	2.01
FOOT1	xxx-xxx-xx	20+ years	47.5	254	134	129	1.97
Total Field Acres:			5,000.00	--	--	--	--

KRWCA Averages by Age Category		Total N Applied lbs/ac	A/Y lbs N/1,000 lbs yield	Est. N Removed lbs/ac	A/R N App/N Removed
Up to 5 Years	Your Average:	220	157	104	2.31
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Overall Averages of All Reported Fields	Your Average:	235	130	140	1.60
	KRWCA Average:	209	84	168	1.24

* All averages are acreage-weighted averages.

- Fields highlighted in red are "significantly higher than averages" for that age category ("**statistical outliers**")
- Compare results coalition averages
- NARs **will change** as new INMP and INMP Summary Report are fully implemented

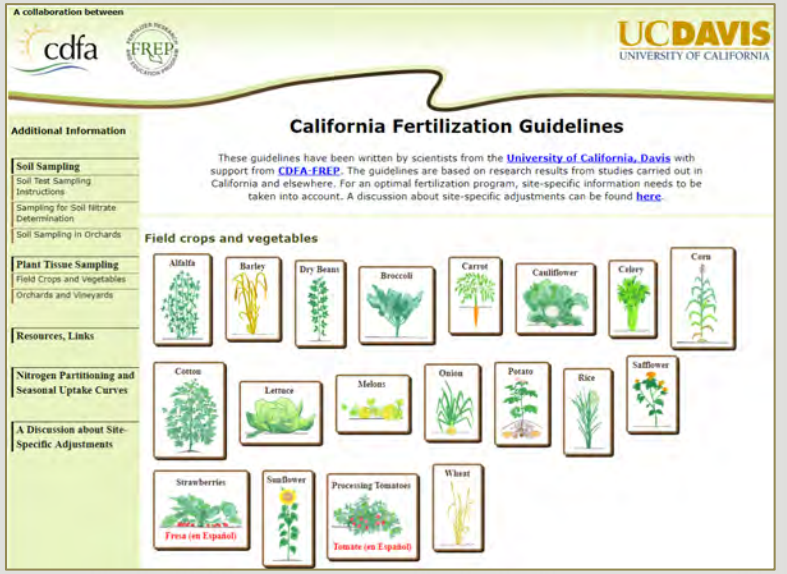
Tools and Resources

What do I do if I didn't make any errors, but my reported fields are still high above the averages?

1. Review information with coalition and CCA
2. California Fertilization Guidelines (Google)

   www.CDFA.ca.gov/go/FREPguide
3. Southern San Joaquin Valley Management Practices Evaluation Program (**SSJV MPEP**)

   www.agmpep.com



Questions?