Kings River Water Quality Coalition

Annual Workshop

Email: <u>info@kingsriverwqc.org</u> Phone: **559-365-7958** Website: <u>http://kingsriverwqc.org</u> Member Portal: <u>http://kingsriverwqc.org/account</u>

Outline

- $\Leftrightarrow\,$ Submittals and On-farm for March 1, 2025
- ♦ General Order Reminders and Regional Water Board Enforcement
- $\Leftrightarrow~2023$ Groundwater and Surface Water Results
- ♦ Groundwater Protection Values & Targets
- Nitrogen Use Evaluations
- ♦ Crop-Specific Ranges of Applied Nitrogen Relative to Nitrogen Removed
- ♦ Nitrogen and Irrigation Efficiency
 - ♦ Dr. Mae Culumber, Farm Advisor, U.C. Agricultural and Natural Resources
 - $\diamond~$ Ph.D. Soil Science and Agroecology
 - ♦ M.S. Plant Science, Molecular Ecology
 - $\diamond~$ Survey, please let us know your thoughts.

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

On-Farm for March 1, 2025

Complete Pre-Season Planning sections of the <u>INMP</u> <u>Worksheet</u> by <u>March 1, 2025</u>

- ♦ Kept On-Farm (Not submitted to KRWQC)
- ♦ Certification required if parcel(s) are:
 - ♦ Located within a <u>high vulnerability</u> area or;
 - Located within <u>low vulnerability</u> area and identified as outlier
- Certification not required for parcels in a <u>low</u> <u>vulnerability</u> area and not identified as outlier

Post-Season

• Complete "Actuals" section for the 2024 Crop Year

IRRIGATION AND NITROGEN MANAGEMENT PLAN (INMP) WORKSHEET

lember ID: INMP Field or MU:			_Crop:	Total Acres:		
			IRRIGATION MANAGEMENT			
	1. Irriga	tion Method*	Pre-Seasor	n Planning		
(check one for Primary; if applicable, check one for Secondary)			2. Crop Evapotranspiration (ET, inches)			
Primary		Drip				
	Ohp Micro Sprinkler Furrow		3 Anticipated Crop Irrigation			
			(inches)			
		Sprinkler				
		Border Strip	4. Irrigation Water N Concentration			
		Flood	(ppm or mg/L, as NO₃-N)			
		5. Irrigation E	Efficiency Practices* (Check all that a	apply)		
 Use of ET in scheduling irrigations Water application schedule to need Use of moisture probe (e.g. tensiometer) 			Pressure Bomb Other Other			
		H/	ARVEST / YIELD INFORMATION	= ()(0)	A ((D)	
		Harvest / Yield I	nformation	Expected (A)	Actual (B)	
6. Product (lbs, to	ion Unit ns, 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			0. Online Augulable Nin Doot Zong			
_	tilizer App	lications	9. Soli – Available N in Root Zone (Annualized, Ibs/ac)			
Irrigation	n Water N	lications Testing	9. Soli – Available N in Root Zone (Annualized, Ibs/ac) 10. N in Irrigation Water*			
Irrigation Soil Tes	tilizer App n Water N ting	lications Testing	9. Soli – Available N in Root Zone (Annualized, Ibs/ac) 10. N in Irrigation Water* (Annualized, Ibs/ac)			
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☐ Irrigation ☐ Soil Tes ☐ Tissue/F ☐ Fertigati ☐ Foliar N ☐ Cover C ☐ Variable ☐ Other:	Nilzer App Water N Petiole Tes on Applicatio rops Rate App	lications Testing sting n lications using GPS	9. Soli – AVailable N in Root Zone (Annualized, Ibs/ac) 10. N in Irrigation Water* (Annualized, Ibs/ac) 11. Organic Amendments* (Manure/Compost/Other, Ibs/ac estimate) 12. Dry/Liquid Fertilizer N* (Ibs/ac) 13. Foliar Fertilizer N* (Ibs/ac)			

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.

INMP Summary Report Due March 1, 2025

Required for all members (high and low vulnerability areas) for previous crop year (2024)

& Submitted **Online** through the Member Portal

<u>http://kingsriverwqc.org/account</u>

*Paper submittals are no longer accepted.

Step 1 MU(s)			Nitrogen Sources				Yield			
Management Unit Description	Total Acres	Specific Crop	N in Irrigation Water (Ibs/acre)	Organic Amendments (lbs/acre)	Dry/Liquid Fertilizers (lbs/acre)	Foliar Fertilizers (lbs/acre)	Harvested Yield (Per Acre)	Production Unit	Yield Information	
Almonds	10	ALM	10	0	110	2	200(Pounds ~	None 🗸	
Oranges	40	CITF	40	0	90	2	20	Bin (1000 lbs)	None 🗸	
Young Aln	20	ALM	20	0	0	0	0	Pounds ~	None 🗸	
Next							None No Yield Non-Bearing No Nitrogen Applied Not Irrigated Seed or Rootstock Irrigation Nitrogen Only Not Farmed Specialty Vegetables			



General Order Reminders

Reminder to add newly purchased and/or leased land to your Coalition parcel enrollment.



<u>Regional Board Enforcement</u> <u>Activates</u>

Enrollment: Directive Letters were sent to growers regarding commercially irrigated ag that was not enrolled.

Notice of Violations were sent to non-responders

INMP Submittal: Notice of Violations were also sent for non submittals.

Regional Board Onfarm Inspections Continues to conduct annual on-farm inspections.

Member selection has previously been based on nonsubmittal of INMP summary report.

Inspection Priorities

- Reports (e.g. INMP, Farm Evaluation)
- Backflow check values
- Fields bordering waterways such as rivers, canals, etc..
- Active wells should free of anything that could have a negative impact on groundwater.
- **Abandoned wells** should be properly covered if temporarily inoperable or destroyed through your county's permitting process if permanent.
- Chemical Storage & Handling (e.g., proper signage and locks)

Drinking Water Well Monitoring

Who is required to sample?

- ♦ An active well is used for human consumption.
- ♦ If your well is not active, you do not have to sample. Contact the Central Valley Regional Water Quality Control Board (CVRWQB).

Central Valley Regional Water Quality Control Board - ILRP Fresno Office

- ♦ 1685 E Street, Fresno, CA 93706
- ♦ (559) 488-4396 | ilrpinfo@waterboards.ca.gov

Sampling Requirements and Frequency

Requirement

- ♦ December 31 due date
- Environmental Laboratory Accreditation Program (ELAP) certified laboratory

Frequency

- ♦ Every 5 Years: Below 8 mg/L for three consecutive years.
- ♦ **No Further Sampling:** If above 10 mg/L
 - ♦ Notify water users within 10 days and submit notice to Regional Board.
- ♦ **Continue Annual Sampling:** 8 and 10 mg/L.

Alternative drinking water my can be applied for through Kings Water Alliance (KWA) at <u>https://kingswateralliance.org/eligibilty/</u>



2023 Surface Water Management Plans Triggered

- E. Coli
 - Cross Creek
 - Stinson Weir
 - Tivy Creek
- Dissolved Copper
 - Tivy Creek
 - SW MPIR
 - Member Outreach

2023 Groundwater N Trends

- Decreasing: 7
- Increasing: 10
- Stable: 1
- Insufficient Evidence: 21
- Insufficient Sample Size: 9

N Applied in Irrigation Water (lbs/ac)						
	12"	24"	36"			
Mg/L NO3-N						
10	27.2	54.4	81.6			
20	54.4	108.8	163.2			
30	81.6	163.2	244.8			



Groundwater Protection Values



KRWQC Boundary

GWP Value is <= 10 mg Nitrate-N/L

Average Nitrate-N Load (lb/ac)





Groundwater Protection Targets

Objective:

 Achieve compliance with receiving water limitations (below 10mb/L) for groundwater on a township level.



Nitrogen Evaluation

Section 3: Outlier Analysis 3-Year Nitrogen Use Evaluation for CITRUS, ORANGES

The Coalition calculates and reports on the pounds of nitrogen applied divided by the pounds of nitrogen removed (A/R ratio). The A/R ratio is a representation and measure of agronomic efficiency. For example, values near or equal to one indicate the amount of nitrogen applied is the same as the amount of nitrogen removed as harvested yield (and stored in wood in perennial crops). Furthermore, an A/R ratio of two indicates that twice as much nitrogen was applied than removed by the crop.

To take into account year to year crop variability, the Coalition determines outliers based on the most recent three years of reported A and R data. An analysis was conducted on your parcel(s) and is provided below.

Assessor's Parcel Number	APN County	Crop Age	3-Year Applied-N/ Removed-R	3-Year Outlier Threshold	3-Year Total Applied-N	3-Year Removed-N	3-Year Applied-N minus Removed-N
APN	County	Age	A/R	Outlier A/R	Α	R*	A - R
000-000-000	Tulare	>4	6.93	6.41	417	60	357
111-111-111	Tulare	>4	7.42	6.41	430	58	372
222-222-222	Tulare	>4	7.34	6.41	442	60	382

Table 1. 3-Year calculation of data reported per parcel.	All units are in pol	unds per acre.
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*R estimates are based on the assumption that nitrogen removed at harvest for CITRUS, ORANGES is 0.00148 lbs N/lbs of fruits.

Background and General Order Requirements for Crop-Specific A/R Ranges

Coalitions are required to develop a Management Practices Evaluation Program (MPEP) to evaluate the effectiveness of management practices in limiting waste discharge from irrigated lands to groundwater.

- ✤ To achieve this goal, objectives include
 - 1. Determine crop-specific coefficients to measure crop yield to N removed, and
 - 2. Determine acceptable ranges for the <u>multi-year</u> A/R ratio targets by <u>crop</u>.

Per the State Water Board (WQ 2018-0002)

- ♦ A metric for evaluating improvements over time (page 39):
 - As recommended by the Agricultural Expert Panel, a multi-year A/R ratio may also provide the basis for acceptable multiyear A/R ratio target values, with reduction in the multi-year A/R ratio toward the target ratio for an area over time acting as a proxy for reduction in nitrate discharge to groundwater
- ♦ Identification of outliers (page 52):
 - Eventually, it is our expectation that **outliers will be determined** with reference to the ranges for the multi-year A/R ratio and A-R difference **target values developed by the Third Party** and the Central Valley Water Board

Additional Information for Acceptable Ranges:

♦ https://kingsriverwqc.org/wp-content/uploads/2025/01/20241007_aracceptableranges_report-1.pdf

Crop-Specific Ranges of Applied (A) Nitrogen Relative to Nitrogen Removed (R) or "A/R Ranges"



N Applied/N Removed

A metric to track nitrogen efficiency and prevent overapplication.

Why It Matters:

Guides improvement of nitrogen use efficiency (NUE) across crops.

Reduces nitrate leaching into groundwater.

Helps growers optimize fertilizer use and cut costs.



How It's Determined:

Based on multi-year data, scientific research, and realworld Central Valley conditions.

Benefits to Growers:

How It Works

- Efficiency: Target achievable nitrogen application levels.
- Cost Savings: Avoid unnecessary fertilizer costs.
- Sustainability: Protect water quality.

• Lower End (smaller A/R ratios)

- Based on optimal conditions and achievable efficiency (e.g., ideal crop uptake rates).
- Upper End (larger A/R ratios) :
 - Reflects real-world conditions (e.g., pest pressures, soil type, climate).
- Both will likely shift over time as real-world farm practices and research evolve.

Using A/R Ranges

Analyze your INMP Summary Report data.
 Compare your field's A/R values to the acceptable range.
 Identify and adjust practices where A exceeds the upper range.

Questions and Contact Information

Contact Information

- Email: <u>info@kingsriverwqc.org</u>
- ♦ Phone: 559.365.7958
- ♦ Virtual Appointment:

https://kingsriverwqc.org/virtualappointment

Questions?