Item-6
Proposed Ag Order 3.0

March 7-8, 2017

Chris Rose
Monica Barricarte
Arwen Wyatt-Mair
Karen Worcester

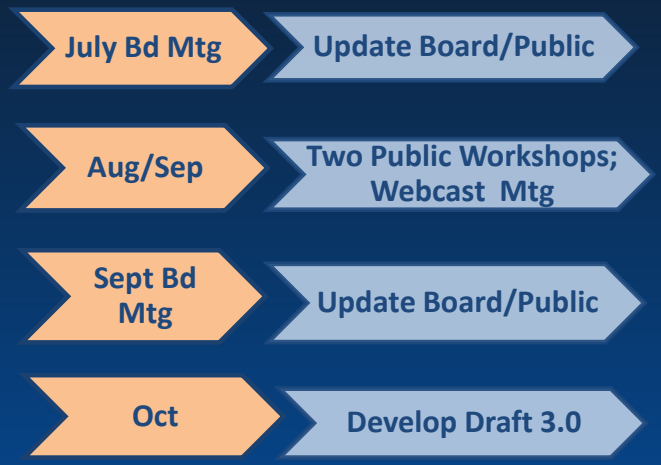
Item Summary

- Current Ag Order expires next week on March 14th
  - Recommendation: adopt Proposed Ag Order today
- Proposed Ag Order temporary, interim Order of three years or less
  - Consistent with Board input and recommendation
  - Consistent with outreach discussions
  - Largely same as current Order; expansion and continuation, where necessary
- Longer term Order being developed
  - Regular Board updates and outreach efforts

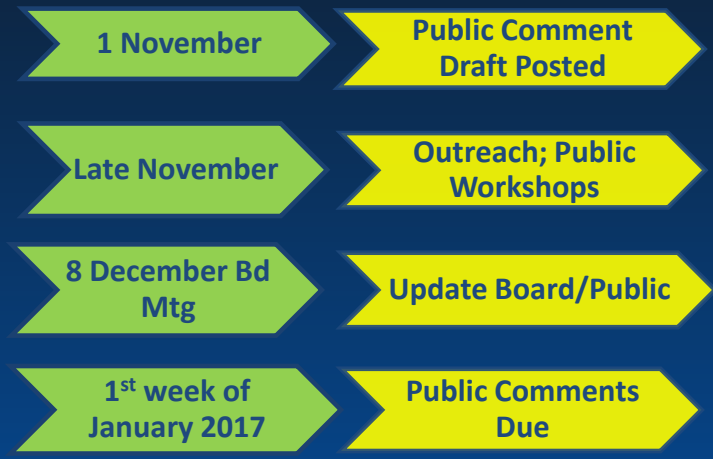
Nomenclature for Discussion

- 2004 Ag Order: version 1.0
- 2012 Ag Order: version 2.0
- 2017 Ag Order: version 3.0
  - Interim
- 2020 Ag Order: version 4.0
  - Long term order

Ag Order 3.0 Development



Ag Order 3.0 Development



Ag Order 3.0 Development

Outreach Events During Development

- August 15, 2016:
  - Webcast with technical service providers
- August 15, 2016:
  - Webcast with Environmental and EJ advocates
- August 23, 2016:
  - Public workshop Salinas
- August 24, 2016:
  - Public workshop Santa Maria
- August 31, 2016:
  - Public workshop San Luis Obispo County Farm Bureau
- September 9, 2016:
  - Webcast with CDFA, DPR, State Board
- October 17, 2016:
  - Webcast with technical service providers

Input from
Board and Stakeholders
+
Staff Evaluation
=
Draft Ag Order 3.0

Draft Order Released

- November 1, 2016: available to public
- Public comments due January 3, 2017
- Granted extension to January 9, 2017
- 69-day comment period
  - Law requires 10-day

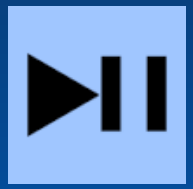
Outreach Events After Draft Released

- November 7, 2016: Public workshop San Luis Obispo Co. Farm B. (north)
- November 9, 2016: Webcast with technical service providers
- November 10, 2016: Public workshop San Luis Obispo Co.Farm B (south)
- November 14, 2016: Webcast , CDFA, DPR, State Board, Co Env Health
- November 16, 2016: Public workshop Santa Maria
- November 28, 2016: Public Workshop Salinas
- November 29, 2016: Public Workshop Monterey County Farm Bureau
- December 8, 2016: Board Meeting item during public comment period

- **Outreach after Pubic Comment Period**
- February 14, 2017: Meeting with CDFA, DPR, State Board, Division of DW
- February 14, 2017: Webcast with agricultural technical service providers

Summary of Changes

- Include
  - –Total Nitrogen Applied expansion
  - –Pesticide and toxicity monitoring



Total Nitrogen Applied

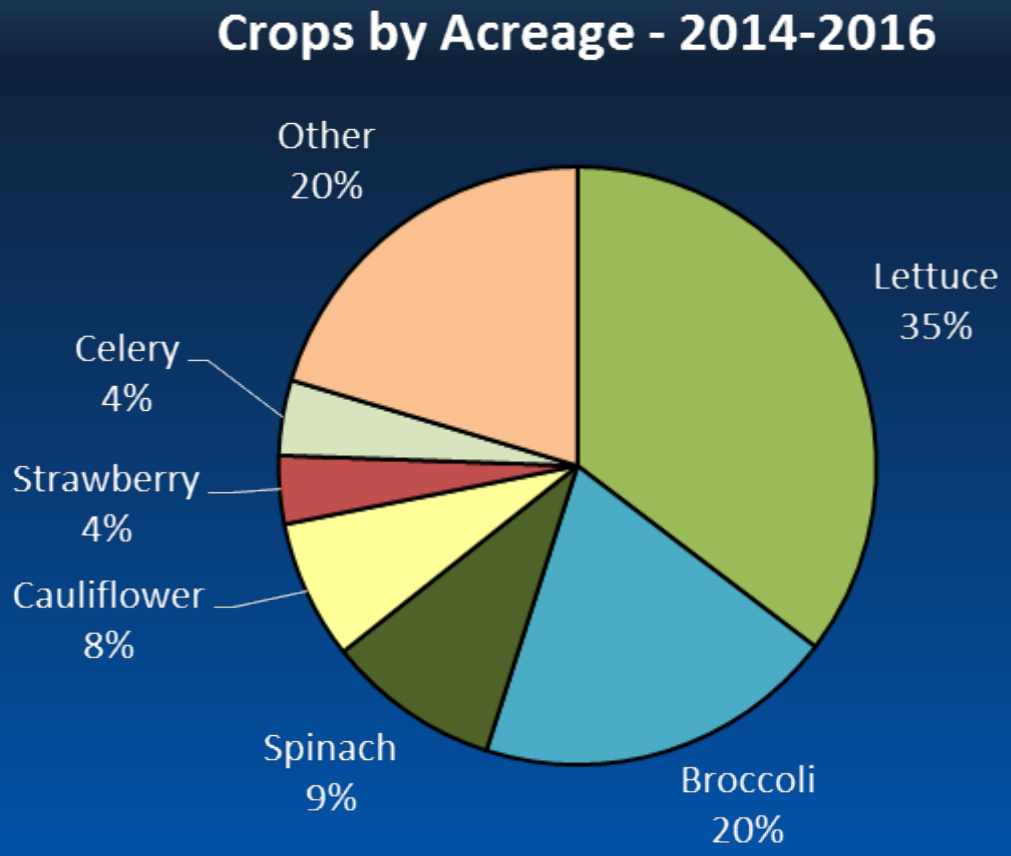
Presented by Monica Barricarte

Total Nitrogen Applied

Presented by M. Barricarte

- Proposed Ag Order 3.0
  - All T2 and T3 ranches w/high risk crops
  - Ag Order 2.0: 600 ranches
  - Ag Order 3.0: 1,700 ranches

3 Year Summary of Crops Reported



2016 values are incomplete and subject to change

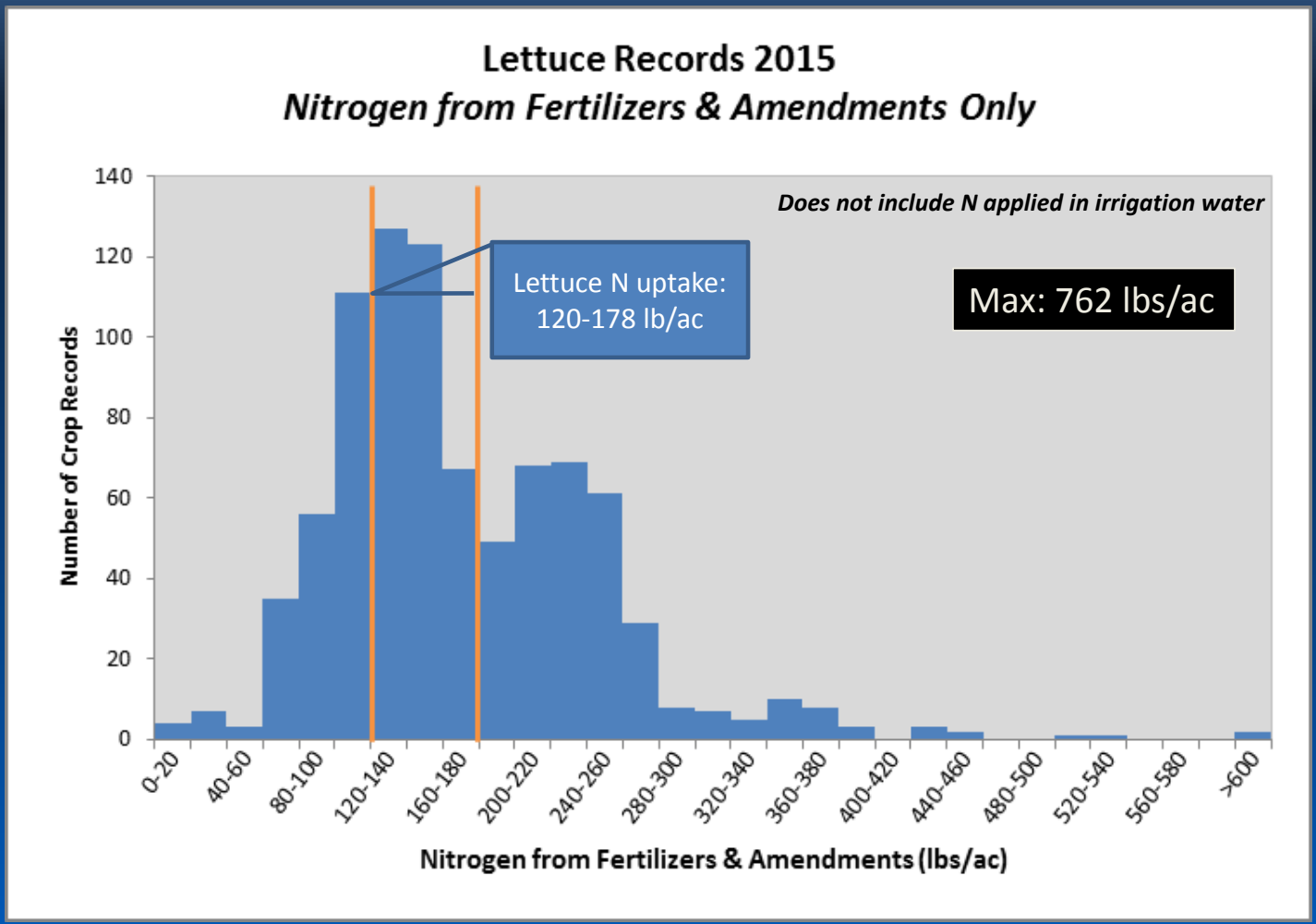
Nitrogen Uptake Ranges (pounds/crop-acre)

Crop	N Crop Uptake Range* (lbs/acre)
	*Maximum Yields
Lettuce (Leaf and Head)	120 - 178

Studies can be found at www.ucanr.edu and www.cdfa.ca.gov

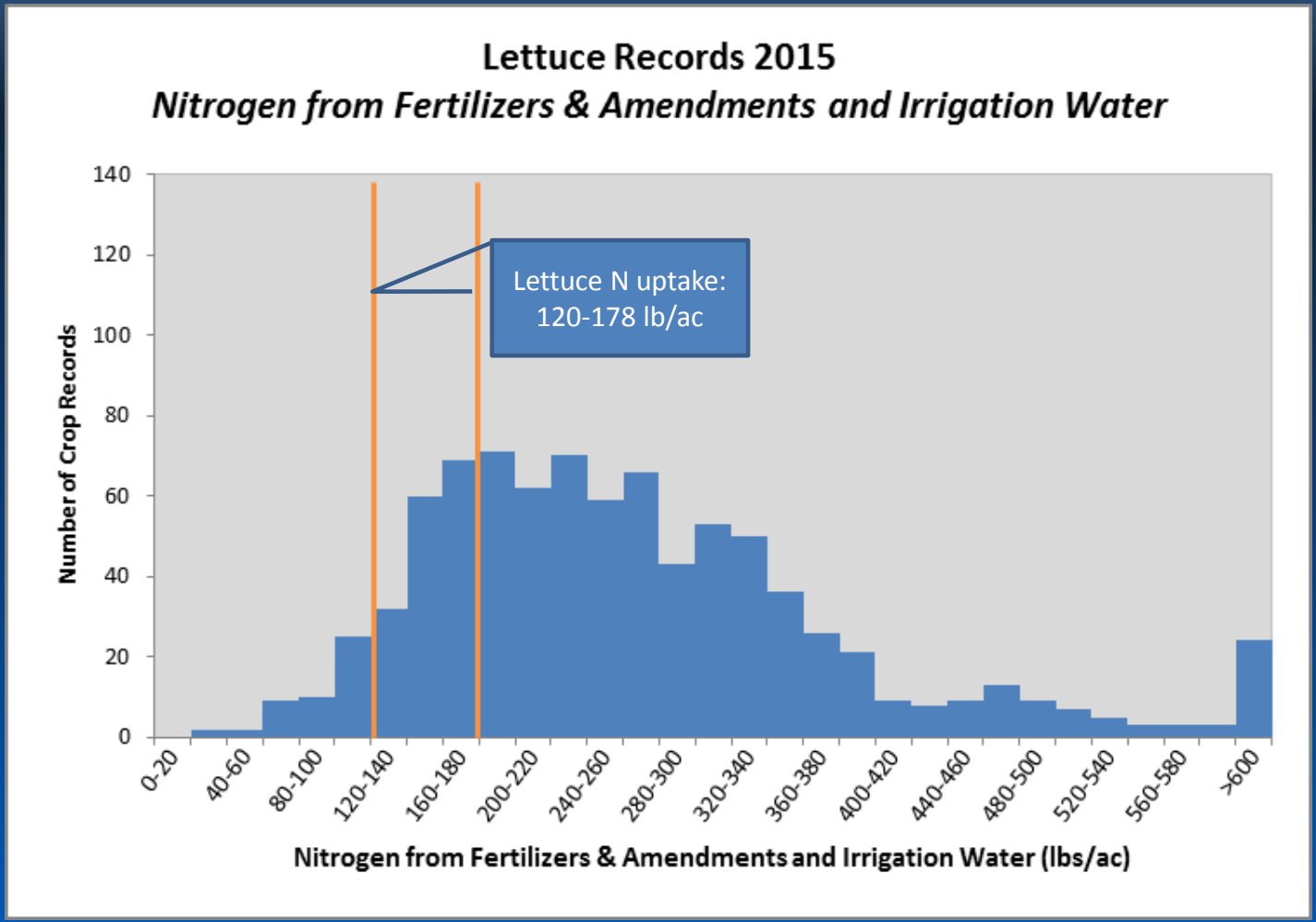
Grower Reported N from Fertilizers

Compared to Specific Crop Nitrogen Uptake



Grower Reported N from Fertilizers & Irrigation

Compared to Specific Crop Nitrogen Uptake



Harvest N Removal Ranges (pounds/crop-acre)

Crop	N Crop Uptake Range* (lbs/acre)	Harvest N Removed (lbs/acre)
	*Maximum Yields	
Lettuce (Leaf and Head)	120 - 178	50 - 80

Studies can be found at www.ucanr.edu and www.cdfa.ca.gov

Crop Nitrogen Uptake & Harvest Removal Ranges (pounds/crop-acre)

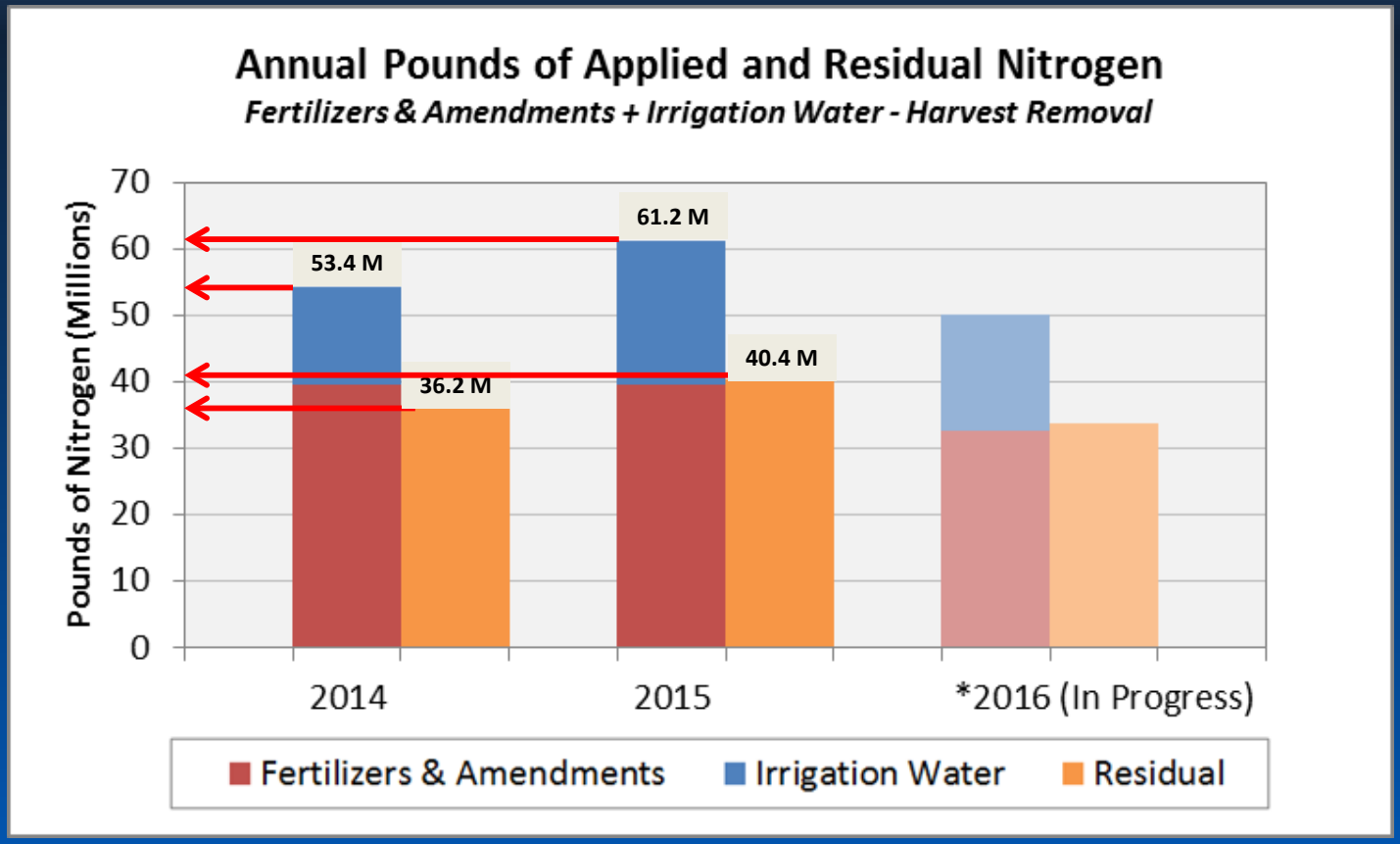
Crop	N Crop Uptake Ranges (lbs/acre)*	Harvest N Removed (lbs/acre)
	*Maximum yields	
Lettuce (Leaf and Head)	120 - 178	50 - 80
Broccoli, Harvest removes 1/3 of the uptake	180 - 337	60 - 112
Spinach (Bunch)	120 - 130	78 - 85
Cauliflower	180 - 285	60 - 70
Strawberry	200 - 240	92 - 100
Celery	200 - 305	120 - 160

Studies can be found at www.ucanr.edu and www.cdfa.ca.gov

N Residual, left in fields after harvest

Photo of lettuce crop

N Residual Relative to N Applied



**2016 values are incomplete and subject to change*

Proposed Total Nitrogen Applied (TNA) Requirement

- Expansion to all Tier 2/3 ranches growing a high risk crop
  - Nitrogen applied reported on all crops grown on the ranch
- Estimate increase from Ag Order 2.0 to 3.0:
  - From 600 to 1,700 ranches
  - From 97,000 to 230,000 acres
  - Note: > 420,000 acres enrolled in Ag Order 2.0
- Why expand the requirement?
  - Nitrogen pollution; agricultural TNA is a significant source
  - Tracking N necessary BMP to address nitrogen pollution
  - Grower awareness first step towards reducing nitrogen loading
  - Only requirement tracking N: applied; reductions; residual
  - Information needed: staff, technical providers, CDFA, educators

Surface Receiving Water Monitoring

Proposed Surface Receiving Water Monitoring

- Two years of pesticide monitoring
- Three years of toxicity monitoring
- Addition of neonicotinoid pesticides
- Addition of toxicity indicator species sensitive to neonicotinoid pesticides
- Removal of some requirements where risk to water quality is low

2014 DPR study shows significant toxicity to alternative test species

FALL 2014: DPR/SWAMP/CMP Region 3

Salinas and Santa Maria Valley Sites	*Hyalella* 10d water	*Chironomus* 10d water	EPA 3 species chronic
Water Sample	SWAMP		CMP
Alisal Slough @ Hartnell Rd	T	T	-
Chualar Creek @ Chualar River Road*	T	NT	NT
Main St. Ditch @ Main St.	NT	NT	NT
Orcutt Creek @ West Main	T	T	NT
Oso Flaco Creek @ OF Lake Rd	T	T	NT
Quail Creek @ SR-101	T	T	NT
Rec Ditch III (Near Airport Blvd)	T	T	NT
Solomon Creek @ SR-1	NT	T	NT
Tembladero Slough @ Haro	T	NT	NT
Percent Toxic	78%	67%	0%

Pesticide Use

1. Neonicotinoid pesticide use increasing
2. Pyrethroid pesticide use increasing
3. Organophosphate pesticide use declining

Pesticide Use Changes

Monterey and Santa Barbara Counties (lbs applied)		
	2010	2014
Neonicotinoids	43,251	70,824

Source: DPR Pesticide Use Database

Pesticide Use Changes

Monterey and Santa Barbara Counties (lbs applied)		
	2010	2014
Neonicotinoids	43,251	70,824
Pyrethroids	46,638	70,378

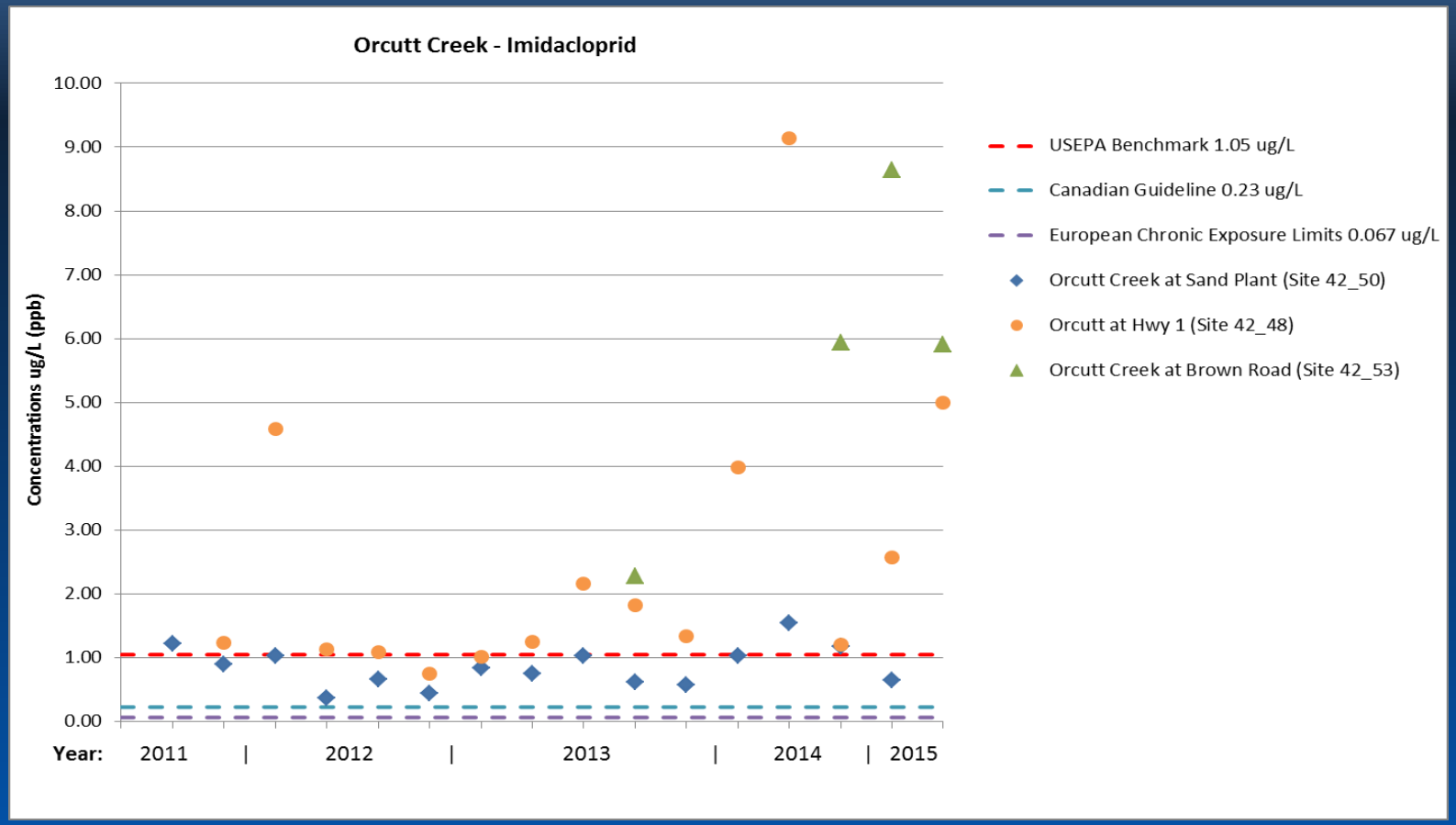
Source: DPR Pesticide Use Database

Pesticide Use Changes

Monterey and Santa Barbara Counties (lbs applied)		
	2010	2014
Neonicotinoids	43,251	70,824
Pyrethroids	46,638	70,378
Chlor/Diaz/ Malathion	362,507	137,147

Source: DPR Pesticide Use Database

Imidacloprid (Neonicotinoid) Concentration



Source: DPR

CA Neonicotinoid Sales 2014-2015

	CA Neonicotinoid Sales 2014-2015 (Lbs)		
	Clothianidin	Imidacloprid	Dinotefuran
2014	20,916	542,262	13,170
2015	119,731	791,125	750,052
Increase (%)	472	46	470

Source: Hoyle and Code, November 2016, *Neonicotinoids in California's Surface Waters, A preliminary Review of Potential Risk to Aquatic Invertebrates,* Xerces Society for Invertebrate Conservation

Proposed Surface Receiving Water Monitoring

- Six neonicotinoids
  - *Chironomus spp*. indicator species for neonics
  - Two years of pesticide monitoring
  - All years toxicity monitoring
- Why?
  - Increasing use of neonicotinoid pesticides
  - Documented exceedance of USEPA benchmark
  - Documented toxicity using species sensitive to neonicotinoids
  - Unexplained toxicity with previously used indicators
  - Information useful for next more long term Ag Order

Proposed Groundwater Monitoring

- Continued monitoring requirement
- 2017
  - Primary irrigation well
  - All domestic wells
- Same frequency as Ag Order 2.0
  - Twice: March-June; September-December
- Monitoring by coalitions: proposals welcome
  - Santa Rosa Creek Valley
  - Central Coast Groundwater Coalition

Public Comments

1. Policy and legal comments: consistency w/Policies
2. Total nitrogen applied expansion: some want less, some want more
3. Monitoring and reporting requirements (MRPs): neonicotinoids; cost; need; process of adoption
4. Economics: cost of compliance
5. New findings: total nitrogen applied data; antidegradation analysis; pesticide use
6. Human right to water: replacement water; public health
7. Cooperatives: current and future importance to growers
8. Toxicity in surface waters: must address

Summary of Changes

	Ag Order 2.0	Draft Ag Order 3.0	Proposed Ag Order 3.0	Reason
1	Term: 5 years	Term: 3 years	Term: 3 years	Anticipate legal and policy issue resolution; board input
2	Total Nitrogen Applied: **600 farms required**	**1,700 farms required**	**1,700 farms required**	Data to address nitrate pollution. Phasing in universal requirement. Consistent with Expert Panel
3	Reports due date (eNOI, ACF, TNA, Disch Mon) **Oct 1 each yr**.	**March 1st each year** beginning 2018	**March 1st each year** beginning 2018	Grower and consultant request. Aligns with growing season. Helps staff implement.
4	INMP Effectiveness Rpt **due once** in Order	**Due annually**	**Due once** March 1, 2019	Grower and consultant request. Discussed at Dec2016 Bd. Mtg. Helps staff implement
5	Water Quality Buffer Plan **due once** in Order	**Due annually**	**Due once** March 1, 2019	Grower and consultant request. Discussed at Dec2016 Bd. Mtg. Helps staff implement.
6	Photo Monitoring **due once** in Order	**Not required**	**Not required**	Photo data gathered; can use remote sensing

Summary of Changes

	Ag Order 2.0	Draft Ag Order 3.0	Proposed Ag Order 3.0	Reason
7	eNOI: grower must name adjacent waterbodies	**Not required**	**Not required**	Grower request. Staff can conduct this analysis
8	eNOI updates due each October 1; growers must annually login to system and update	**Not required if no change.** W/in 30-d of change in enrollment info.	**Not required if no change.** W/in 60-d of change in enrollment info.	Grower request to not edit/check eNOI unless change occurs. Some operations have no change from year to year
9	ACF Sec-C Risk Assessment: grower must complete annually	**Not required**	**Not required**	Sec-C was used to trigger requirements like TNA. TNA now triggered by high risk crops. Also, Sec-C asked growers to "predict" the next years farming plans; they stated this largely not possible
10	ACF Sec-B well N concentration: grower must report annually	**Not required**	**Not required**	Growers and consultants requested removal because redundant in TNA form. Groundwater monitoring also required in MRPs

Summary of Changes

	Ag Order 2.0	Draft Ag Order 3.0	Proposed Ag Order 3.0	Reason
11	Operator requirement to notify new operator of Order w/in 60 days	Within 30 days	**Within 60 days**	Consultants requested retain original 60 day requirement; staff agrees-does not affect implementation
12	New operator must enroll ranch within 60 days of control	Within 30 days	**Within 60 days**	Consultants requested retain original 60 day requirement. Staff agrees, but ranch must be enrolled prior to discharging.
13	Reports are due X-days after ranch termination: X not stated	Within 30 days	**Within 60 days**	Consultants requested 60 days, staff agrees-does not affect implementation

Summary

1. Current Ag Order 2.0 expires March 14, 2017
2. Proposed Order:
    1. Temporary, interim order
    2. Continues many current requirements
    3. Incrementally expands requirements, where necessary
    4. Consistent with Board input/recommendation
3. Staff developing longer term Order (v 4.0)

Recommendation

Adopt Order No. R3-2017-0002 and associated Monitoring and Reporting Programs

R3-2017-0002-01

R3-2017-0002-02

R3-2017-0002-03

Discussion

Extra Slides

Ag 2.0 and 3.0 Order Components

- Online enrollment: GeoTracker
- Tier structure: 3 tiers; increasing requirements
- Surface RW MRPs: 50 sites; all Ag watersheds
- Groundwater MRPs: primary and domestic
- Total Nitrogen Applied Reporting
- Irrigation and Nutrient Management Plan
- Water Quality Buffer Plan
- Edge of field monitoring

From Sept. 2016 Board Meeting

Options Considering for 3.0 Total Nitrogen Applied Reporting

REQUIRED RANCHES	ACRES	RANCHES	OTHER
Current requirement: High Risk T2 /T3	97,000	600	1) Section-C ACF required 2) Some high risk crops not reported
T1, T2, T3	420,000	4,300	1) Includes low risk crops 2) Tier1 high risk = 2% enrolled acres
All T2, T3 exclude Grapes/Orchards	230,000	1,700	1) Includes nearly all high risk crops grown 2) Revises/removes ACF Section-C

Summary of Surface Water MRPs

PARAMETER	AG ORDER 2.0 MRP	PROPOSED MRPs: 2017-18	PROPOSED MRPs 2019
Physical Parameters (flow, pH, EC, DO…)	Every monitoring event	Every monitoring event	Every monitoring event
Nutrients (N, P…)	Monthly incl. 2 stormwater events	Monthly	Monthly
Water Column Toxicity			
Algae	Twice in dry, twice in wet season	Twice in dry, twice in wet season	Twice in dry, twice in wet season
Ceriodaphnia	Twice in dry, twice in wet season	Twice in dry, twice in wet season	Twice in dry, twice in wet season
Fathead minnow	Twice in dry, twice in wet season	NOT REQUIRED	NOT REQUIRED
Chironomous	NOT REQUIRED	Twice in dry, twice in wet season	Twice in dry, twice in wet season
Water Chemistry			
Carbamate Pesticides (6)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	NOT REQUIRED	NOT REQUIRED
Organophosphate Pesticides (13)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Herbicides (8)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Metals (9)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Total phenolic compounds	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Neonicotinoids (5)	NOT REQUIRED	Thiamethoxam, Imidacloprid,Thiacloprid, Dinotefuran, Acetamiprid, Clothianidin (new to draft 3.0 MRPs)	NOT REQUIRED
Sediment Sampling			
Sediment Toxicity: Hyalella	Annually	2 times, once in spring once in fall concurrent w/sed tox	2 times, once in spring once in fall concurrent w/sed tox
Benthic Invertebrate/Physical Habitat	Once in 2nd or 3rd year w/sed tox	NOT REQUIRED	NOT REQUIRED
Pyrethroid Pesticides (11)	Once in 2nd or 3rd year w/sed tox	2 times, once in spring once in fall concurrent w/sed tox	NOT REQUIRED
Organochlorine Pesticides (2)	Once in 2nd or 3rd year w/sed tox	NOT REQUIRED	NOT REQUIRED
Chlorpyrifos Pesticide	Once in 2nd or 3rd year w/sed tox	2 times, once in spring once in fall concurrent w/sed tox	NOT REQUIRED

Legal, Policy and Data Issues

- Monterey Coastkeeper vs State Water Board
- East San Joaquin Agricultural Order
- Triangle/Rava Ranches vs Cen. Coast Water Board
- Zamora/Environmental Law Foundation vs Central Coast Water Board
- Several requirements due end of term

Estimations of N Residual

Year	ACREAGE		APPLIED		REMOVED
	Ranch Acres	Crop Acres Grown	Fertilizers and Amendments (A)	Irrigation Water (B)	With Crop Harvest (C)
2014	115,211	200,645	39,435,093	14,877,674	17,380,844
2015	118,010	227,367	39,593,007	21,569,341	19,767,531
2016	97,088	182,399	32,641,052	17,573,737	15,326,126

Includes estimated reductions due to N losses as gas emissions and irrigation water runoff

2016 values are incomplete and subject to change

Data/calculations

Estimations of N Residual

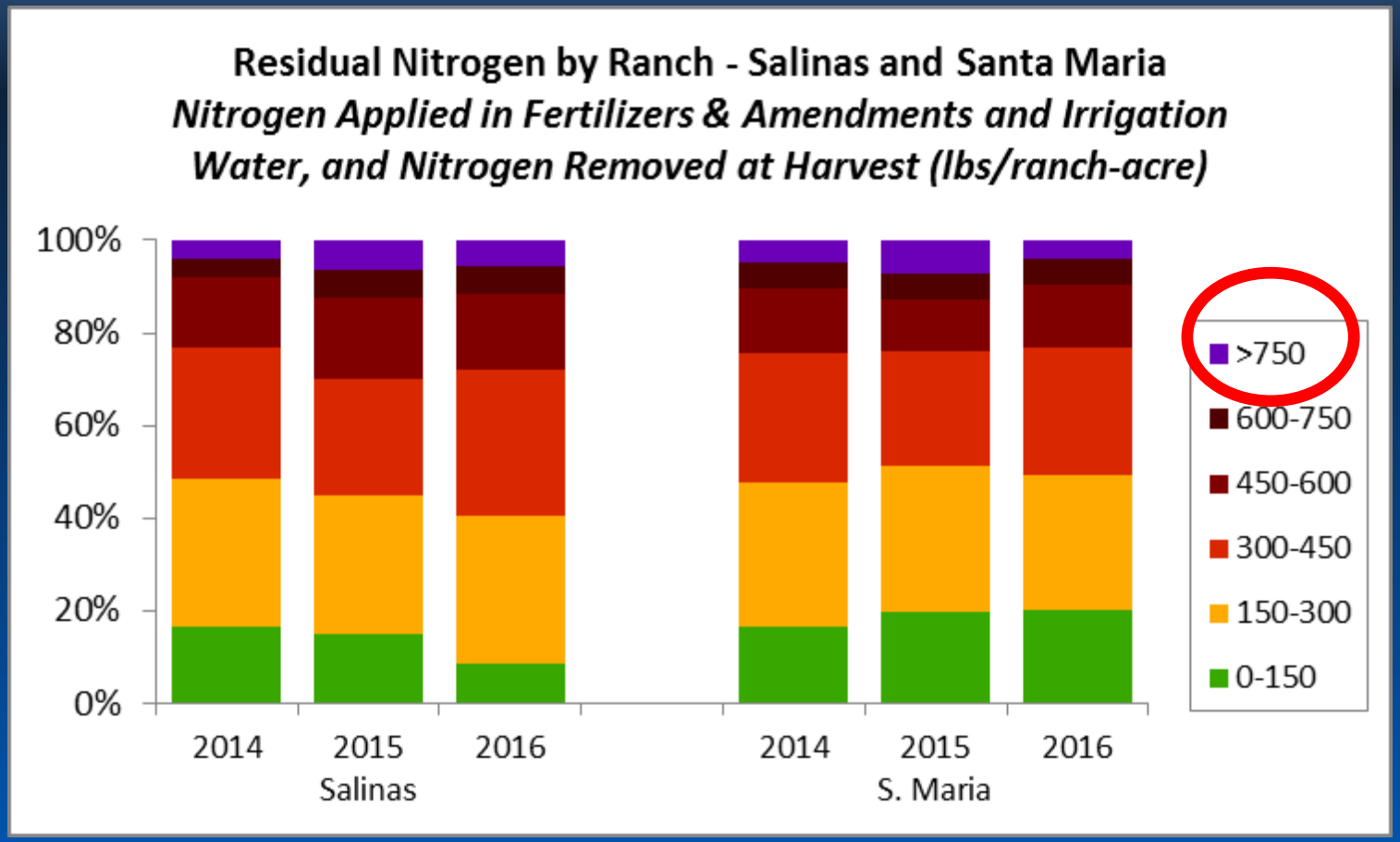
Year	RESIDUAL*	
	Accounting for N from Fert/Amend Only (Pounds)	**Accounting for N from Fert/Amend and Irrigation** (Pounds)
2014	21,882,962	36,196,020
2015	19,761,775	40,404,511
2016	16,949,241	33,743,095

Includes estimated reductions due to N losses as gas emissions and irrigation water runoff

****2016 values are incomplete and subject to change***

Data/calculations

Percentage of Ranches with ranges of N Residual 3 years, Santa Maria and Salinas

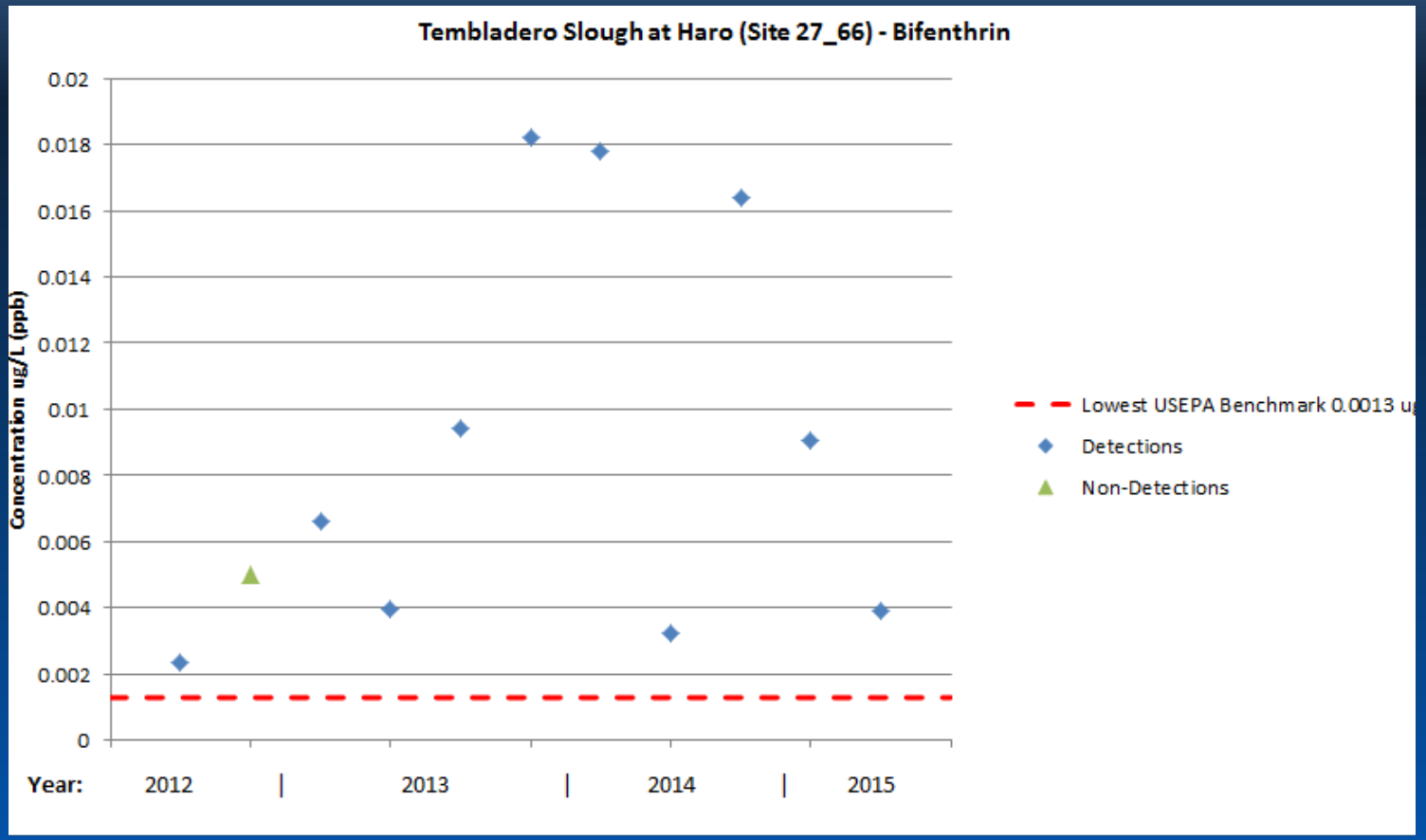


**Includes estimated reductions due to N losses as gas emissions and irrigation water runoff*

2016 values are incomplete and subject to change

Data/calculations

Pyrethroid: Bifenthrin



Source: DPR

Summary of Surface Water MRPs

PARAMETER	AG ORDER 2.0 MRP	PROPOSED MRPs: 2017-18	PROPOSED MRPs 2019
Physical Parameters (flow, pH, EC, DO…)	Every monitoring event	Every monitoring event	Every monitoring event
Nutrients (N, P…)	Monthly incl. 2 stormwater events	Monthly	Monthly
Water Column Toxicity			
Algae	Twice in dry, twice in wet season	Twice in dry, twice in wet season	Twice in dry, twice in wet season
Ceriodaphnia	Twice in dry, twice in wet season	Twice in dry, twice in wet season	Twice in dry, twice in wet season
Fathead minnow	Twice in dry, twice in wet season	**NOT REQUIRED**	**NOT REQUIRED**
Chironomous	NOT REQUIRED	Twice in dry, twice in wet season	Twice in dry, twice in wet season
Water Chemistry			
Carbamate Pesticides (6)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	**NOT REQUIRED**	**NOT REQUIRED**
Organophosphate Pesticides (13)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Herbicides (8)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Metals (9)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Total phenolic compounds	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Neonicotinoids (5)	NOT REQUIRED	Thiamethoxam, Imidacloprid,Thiacloprid, Dinotefuran, Acetamiprid, Clothianidin (new to draft 3.0 MRPs)	NOT REQUIRED
Sediment Sampling			
Sediment Toxicity: Hyalella	Annually	2 times, once in spring once in fall concurrent w/sed tox	2 times, once in spring once in fall concurrent w/sed tox
Benthic Invertebrate/Physical Habitat	Once in 2nd or 3rd year w/sed tox	**NOT REQUIRED**	**NOT REQUIRED**
Pyrethroid Pesticides (11)	Once in 2nd or 3rd year w/sed tox	2 times, once in spring once in fall concurrent w/sed tox	NOT REQUIRED
Organochlorine Pesticides (2)	Once in 2nd or 3rd year w/sed tox	**NOT REQUIRED**	**NOT REQUIRED**
Chlorpyrifos Pesticide	Once in 2nd or 3rd year w/sed tox	2 times, once in spring once in fall concurrent w/sed tox	NOT REQUIRED

Removed constituents

Summary of Surface Water MRPs

PARAMETER	AG ORDER 2.0 MRP	PROPOSED MRPs: 2017-18	PROPOSED MRPs 2019
Physical Parameters (flow, pH, EC, DO…)	Every monitoring event	Every monitoring event	Every monitoring event
Nutrients (N, P…)	Monthly incl. 2 stormwater events	Monthly	Monthly
Water Column Toxicity			
Algae	Twice in dry, twice in wet season	Twice in dry, twice in wet season	Twice in dry, twice in wet season
Ceriodaphnia	Twice in dry, twice in wet season	Twice in dry, twice in wet season	Twice in dry, twice in wet season
Fathead minnow	Twice in dry, twice in wet season	NOT REQUIRED	NOT REQUIRED
Chironomous	NOT REQUIRED	**Twice in dry, twice in wet season**	Twice in dry, twice in wet season
Water Chemistry			
Carbamate Pesticides (6)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	NOT REQUIRED	NOT REQUIRED
Organophosphate Pesticides (13)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Herbicides (8)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Metals (9)	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Total phenolic compounds	4 times in 2nd or 3rd year; concurrent w/tox monitoring	2 times, once in dry once in wet season concurrent with water tox	NOT REQUIRED
Neonicotinoids (6)	NOT REQUIRED	**Thiamethoxam, Imidacloprid,Thiacloprid, Dinotefuran, Acetamiprid, Clothianidin (new to draft 3.0 MRPs)**	NOT REQUIRED
Sediment Sampling			
Sediment Toxicity: Hyalella	Annually	2 times, once in spring once in fall concurrent w/sed tox	2 times, once in spring once in fall concurrent w/sed tox
Benthic Invertebrate/Physical Habitat	Once in 2nd or 3rd year w/sed tox	NOT REQUIRED	NOT REQUIRED
Pyrethroid Pesticides (11)	Once in 2nd or 3rd year w/sed tox	2 times, once in spring once in fall concurrent w/sed tox	NOT REQUIRED
Organochlorine Pesticides (2)	Once in 2nd or 3rd year w/sed tox	NOT REQUIRED	NOT REQUIRED
Chlorpyrifos Pesticide	Once in 2nd or 3rd year w/sed tox	2 times, once in spring once in fall concurrent w/sed tox	NOT REQUIRED

Added constituents

TNA Expansion

- Understand current typical N applications
  - Compare with uptake and removal rates
  - Identify potential for improvement
  - Current impacts of applications, by location
    - Impaired drinking water supplies
- Inform Order 4.0
  - Information acts as a proxy for estimating potential loading
  - Identify potential future impacts and high risk areas within the region
    - Surface water
    - Groundwater
    - Human health
- Verify effectiveness of practices and changes made over time
  - Application rate versus uptake rates
  - Pump and fertilize
  - Reuse of residual nitrogen

TNA Expansion

1. We will be able to better understand the impacts of the N application onto farmland to groundwater,
2. Identify the high nitrogen application areas, units, crops,
3. Gain a greater understanding of the N over-application extent and recurrence,
4. Minimize the uncertainties related to the spatial and time scale variations and the difficulties in monitoring actual loading occurring from Ag fields into the unsaturated (vadose) zone,
5. Re-assess the areas of risk for contaminating groundwater based on surface nitrogen applications and therefore,
6. Establish areas that could pose a threat to human health,
7. Ultimately use the nitrogen application to land is useful information to make sound regulatory decisions. For example follow up in certain areas based on current impairment, or use N loading potential to protect specific areas, wells, or communities.
8. Finally, the data show that there is significant room for improvement. We wouldn't know that there was room for improvement if we had never seen this information..

Also this information can provide compliance assistance by:

1. educating growers on how much nitrogen is needed and how much extra is being applied,
2. assisting individual growers in making improvements over time

Growers can help improve the situation by adopting different BMPs, such as pump and fertilize and reuse of N left in fields.

Most importantly this information can be used to verify the effectiveness of the practices and changes/improvements made over time.