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July 1, 2014

Pamela Creedon, Executive Officer
Jelena Hartman
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

Dear Ms. Creedon,

The East San Joaquin Water Quality Coalition is submitting an addendum to the 2014 Annual Report (submitted on May 1, 2014) to include the Farm Evaluation Summary. As required by the Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed (WDR or General Order; Order No. R5-2012-0116-R1), members within high vulnerability areas were required to complete and return their Farm Evaluation for each enrolled parcel(s) by the March 1, 2014 deadline which was extended to May 1, 2014. The Coalition is required to report the Farm Evaluation Summary on May 1 annually. Because of extenuating circumstances surrounding the implementation of the Farm Evaluation Surveys by the Coalition, the deadline was extended to July 1, 2014 (extension approved March 27, 2014).

This addendum summarizes Farm Evaluation data collected for irrigation management practices, sediment management practices, pesticide and nutrient management, and well management practices for irrigation and abandoned wells.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment for violations.

Submitted respectfully,

Parry Klassen
Executive Director
East San Joaquin Water Quality Coalition

Annual Report

Farm Evaluation Addendum



Submitted July 1, 2014

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FARM EVALUATION ADDENDUM

As outlined in the Waste Discharge Requirements General Order for Growers within the Eastern San Joaquin River Watershed (WDR or General Order; Order No. R5-2012-0116-R1), the East San Joaquin Water Quality Coalition (ESJWQC or Coalition) is submitting a summary of management practice information obtained from Farm Evaluations. Members within high vulnerability areas were required to complete Farm Evaluations for enrolled parcels and return surveys to the Coalition by the March 1, 2014 deadline which was extended to May 1, 2014. The Coalition is required to report the Farm Evaluation Summary on May 1 annually. Because of extenuating circumstances surrounding the implementation of the Farm Evaluation Surveys by the Coalition, the deadline was extended to July 1, 2014 (approved March 27, 2014).

This report is an addendum to the 2014 Annual Report and summarizes management practices implemented by members during 2013. These practices are designed to protect surface water and groundwater quality.

The Farm Evaluations are designed to collect from each grower the following information:

1. identification of crops grown and acreage of each crop,
2. geographical location of the member's farm,
3. identification of on-farm management practices implemented to achieve the WDR farm management performance standards,
4. identification of whether or not there is movement of soil during storm events and/or during irrigation (sediment and erosion risk areas) and a description of where within the property this occurs,
5. identification of whether water leaves the property and is conveyed downstream and a description of where within the property this occurs,
6. location of active wells and abandoned wells, and
7. identification of whether wellhead protection and installation of backflow prevention devices have been implemented.

Information attained from Farm Evaluations describes how each member is implementing management practices to protect water quality while trend data are collected through monitoring. Management practices designed to protect the quality of surface and groundwater should be implemented, where applicable, by members in high or low vulnerability areas. Data from the Farm Evaluations can be used to evaluate changes in surface water quality relative to changes in management practices.

The Farm Evaluation Surveys contain four sections with questions specific to both surface and groundwater management practices. Growers are required to complete:

- Part A: Whole Farm Evaluation – general farm information covers all parcels farmed by the member.
- Part B: Specific Field Evaluation – information for each field or management unit.
- Part C: Irrigation Well Information - one page for each membership or farm.
- Part D: Sediment and Erosion Control Practices – information for each field or management unit.

Table 1 includes the Farm Evaluation submittal deadlines for high and low vulnerability areas. ESJWQC members within high vulnerability areas must submit a Farm Evaluation annually by March 1. Low vulnerability farming operation areas have a reporting frequency of every five years and extended time for submitting their first farm evaluation.

Table 1. Farm Evaluation deadlines for high and low vulnerability areas in the ESJWQC.

FARMING OPERATIONS ¹	DOCUMENT REQUIRED	DUE DATE ¹	UPDATES REQUIRED	REPORT TO RB
High Vulnerability Areas (greater than 60 irrigated acres)	Farm Evaluation	March 1, 2014 ²	March 1 annually	May 1, 2014 ²
Small Farming High Vulnerability Area (less than 60 irrigated acres)				
Low Vulnerability Areas (greater than 60 acres)	Farm Evaluation	March 1, 2015	every 5 years	May 1, 2015
Small Farming Low Vulnerability Area (less than 60 irrigated acres)		March 1, 2017	every 5 years	May 1, 2017

¹-Relevant for surface or groundwater

²-On January 27, 2014 the Coalition requested to extend the deadline for high vulnerability areas to return their Farm Evaluation from March 1, 2014 to May 1, 2014 and to extend the Annual Report WDR component (18) to be extended from May 1, 2014 to July 1, 2014 (Approved March 27, 2014).

High vulnerability areas are the geographic regions with the Coalition area where there is a management plan due to surface or groundwater quality impairments or where the area has been determined to be highly vulnerable for groundwater in the Groundwater Assessment Report (GAR). Since the groundwater vulnerability analysis submitted in the GAR was not approved before surveys needed to be sent to growers, the ESJWQC sent Farm Evaluations to all of its members but noted the vulnerability designations based on existing surface water management plans and the tentative vulnerability designations as outlined in the GAR.

The list of members created in January 2014 was used to evaluate the status of returned surveys. All members on the list were sent notifications regarding survey completion deadlines and provided with the option of completing either a hard copy of the survey or an online version. The ESJWQC held workshops at local Farm Bureaus to assist growers with filling out the surveys and answering questions.

Surveys were pre-populated with information about member parcels provided by the members on their annual membership forms. Members were asked to correct crop information and update acreage as needed. Survey responses were recorded in an Access database and linked to an Assessor Parcel

Number (APN) and acreage. The results were grouped by TRS and are being submitted in an Access database along with this report.

The following actions were taken to assist growers with completing their Farm Evaluation Survey:

- Meetings were held with members where the Coalition's Executive Director described each question and all available responses. This helped reduce confusion on how to answer a question on the survey.
- Workshops were held at local Farm Bureaus that allowed Coalition representatives to help members with questions and responses. Providing assistance with answering questions was important to ensure that the member was able to fill in the survey accurately.
- Members were contacted by phone for follow-up when there were unanswered questions or their responses were unclear; this only occurred for priority questions that were essential to the survey (management practice questions) and not all members could be contacted prior the submission of this report.
- Data were reviewed in the database to reduce errors including comparing acreages provided by the members versus acreages enrolled with the Coalition.

During the data entry process, reviewing responses indicated several areas of concern:

- Data entry assigns all APNs with any comments, acres, or changes – anything written next to an APN was considered part of response page for B and D. This affected the number of APNs that could be mapped.
- Many members did not divide their APN acreage into each Site ID/Field ID. It is unclear whether this was because of a lack of understanding of how to subdivide their APNs, or if they simply failed to complete the subdivision as requested. Failure to complete this task potentially affects the accuracy of the acreage associated with each management practice. If acreage was not filled in by the member and they could not be reached for clarification, the default became the acreage signed up with the Coalition was the acreage assigned to the management practices listed in the survey.
- Surveys were returned without all questions completed. When surveys were reviewed and missing responses were noted, the Coalition called as many members as possible to complete the missing responses.

FARM EVALUATION SUMMARY

Surface water vulnerability (high or low) was assigned to each member parcel based on current ESJWQC surface water quality management plans. Groundwater vulnerability (high or low) was assigned to each parcel based on the ESJWQC GAR (conditionally approved on June 4, 2014). An overall vulnerability was assigned to parcels associated with a survey if at least one of those parcels was located in a surface water high vulnerability area or a groundwater high vulnerability area. The ESJWQC received completed surveys from 80% of the members expected to return surveys which includes 87% of the Coalition acreage. Surveys were returned for 86% of the high vulnerability areas representing 84% of the members (Table 2). A subset of members who were sent a survey did not need to complete them because the member had no enrolled acreage with the Coalition during 2013 (a member may do this if the ground will be temporarily fallowed), they did not farm in 2013 (new members who recently acquired the land), or they are no longer a member (Table 3).

Figure 1 illustrates the parcels for which surveys were returned. Figure 2 includes the groundwater vulnerability designations as proposed in the ESJWQC GAR. Of the parcel numbers provided on the returned Farm Evaluations, 422 parcels could not be mapped. Reasons for the inability to map include 1) the member assigned the parcel to the incorrect county, 2) the parcel number was changed to an incorrect format, 3) the parcel number has been updated, and/or 4) either the member reported an old parcel number or the GIS parcel layer has not yet been updated to include that parcel.

Table 2. Sum of acreage and count of members represented by returned farm evaluations.

SURVEY STATUS	SW VULNERABILITY	GW VULNERABILITY	OVERALL VULNERABILITY	SUM OF ACREAGE	COUNT OF MEMBERS
Received	SW Low	GW High	High	164,538.59	1,486
		GW Low	Low	25,145.34	255
	SW High	GW High	High	346,097.13	1,092
		GW Low	Low	56,643.53	232
Returned Total				592,424.58	3,065
Not Received	SW Low	GW High	High	27,569.53	362
		GW Low	Low	5,848.92	87
	SW High	GW High	High	52,725.55	269
		GW Low	Low	5,313.62	49
Not Returned Total				91,457.62	767
GRAND TOTAL				683,882.20	3,832
% HIGH VULNERABILITY OF TOTAL				86%	84%
% LOW VULNERABILITY OF TOTAL				14%	16%

GW-Groundwater
SW-Surface water

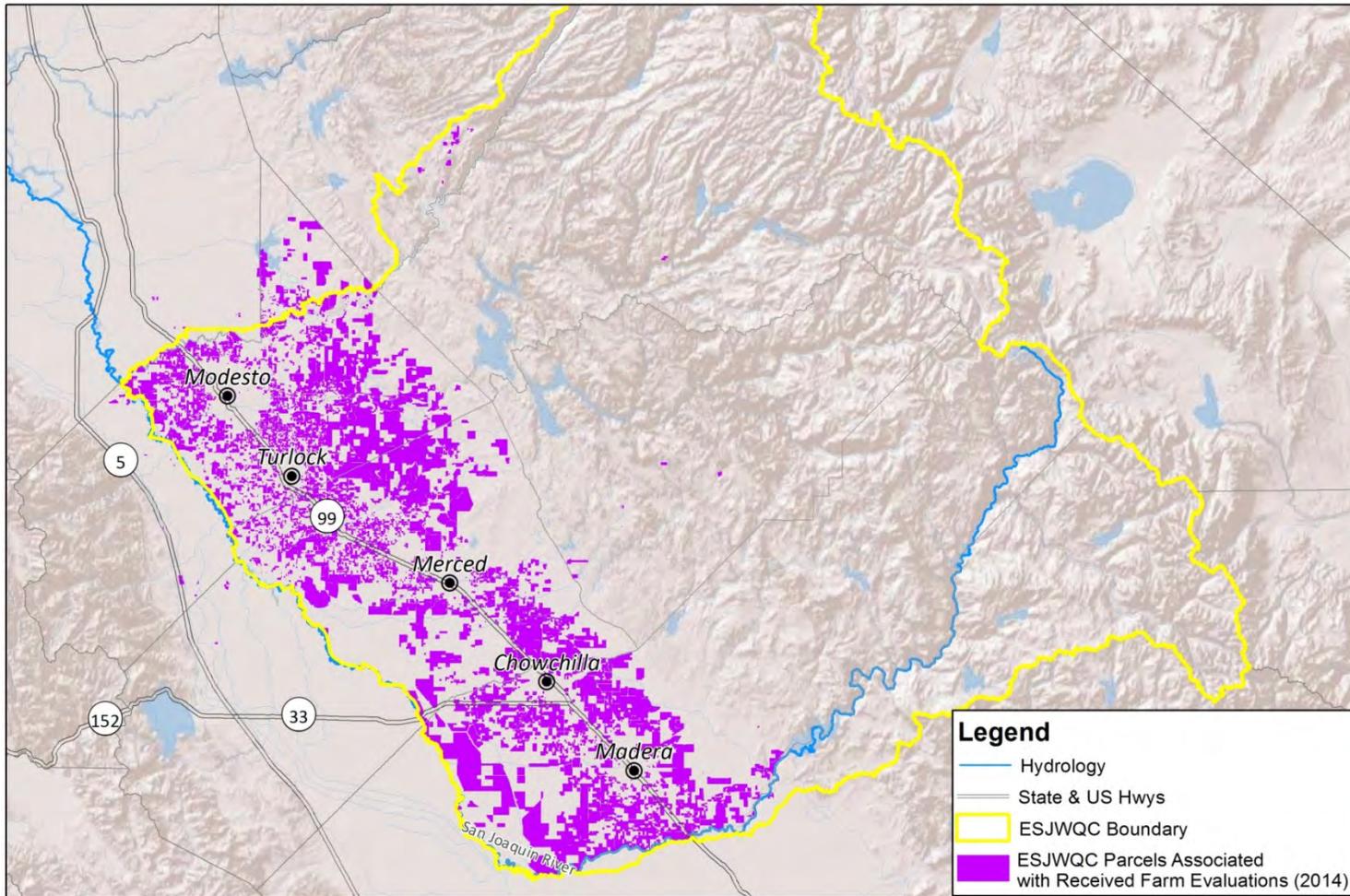
Figure 3 includes the acreage of different crops and the percentage of the total acreage of crops reported by members on returned farm evaluations. Almost half of the crop acreage is occupied by almonds, with a lesser percentage occupied by grapes, pistachios, corn, and alfalfa.

Table 3. Sum of acreage and count of members sent a survey but did not need to complete one.

REASON FOR NO SURVEY	SW VULNERABILITY	GW VULNERABILITY	OVERALL VULNERABILITY	SUM OF ACREAGE	COUNT OF MEMBERS
0_Irrigated_Acres	SW Low	GW High	High	11.00	20
		GW Low	Low	58.35	19
	SW High	GW High	High	34.90	13
		GW Low	Low	0.00	4
<i>Irrigated_Acres Total</i>				104.25	56
Did_Not_Farm_2013	SW Low	GW High	High	17.50	2
	SW High	GW Low	High	20.00	1
<i>Did_Not_Farm_2013 Total</i>				37.50	3
Past_Membership	SW Low	GW High	High	5,820.68	39
		GW Low	Low	821.60	10
	SW High	GW High	High	5,325.47	17
		GW Low	High	1,320.11	6
<i>Past_Membership Total</i>				13,287.86	72
GRAND TOTAL				13,429.61	131
% HIGH VULNERABILITY OF TOTAL				84%	70%
% LOW VULNERABILITY OF TOTAL				16%	30%

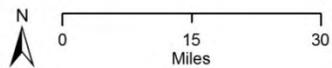
GW-Groundwater
SW-Surface water

Figure 1. ESJWQC member parcels associated with one or more returned farm evaluation.



Source of Layers:
 Hydrology - NHD hydrodata, 1:24,000-scale, <http://nhd.usgs.gov/>
 Roads: highways, railroads, county boundary, city outlines - California Spatial Information Library.
 Basemap, World Imagery - ESRI
 Datum - NAD1983

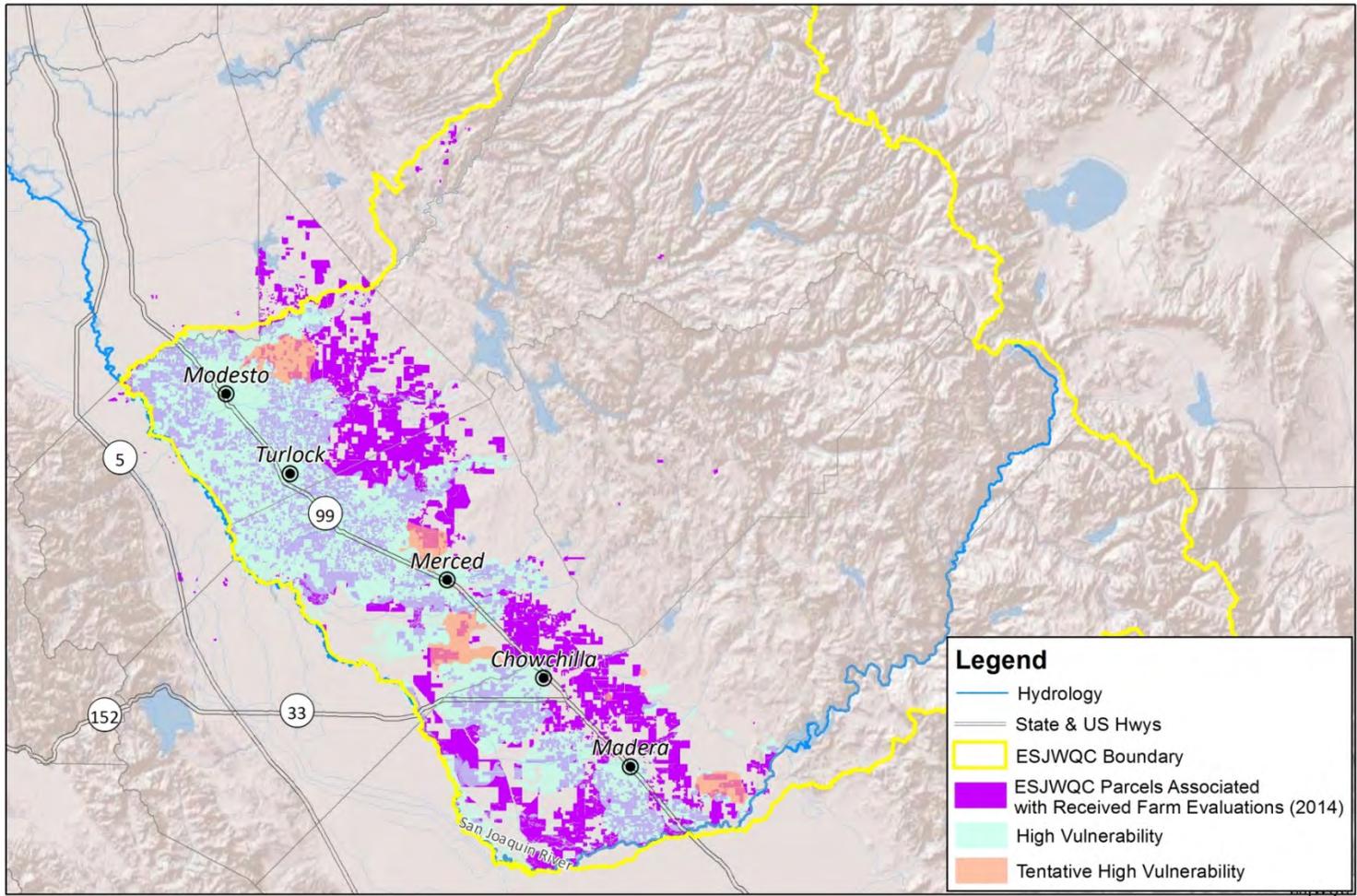
Date Prepared: 6/26/2014



ESJWQC Member Parcels Associated with Farm Evaluation Results (2014)

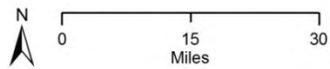
ESJWQC_2014

Figure 2. ESJWQC member parcels associated with one or more farm evaluation and groundwater high vulnerability areas.



Source of Layers:
 Hydrology - NHD hydrodata, 1:24,000-scale, <http://nhd.usgs.gov/>
 Roads, highways, railroads, county boundary, city outlines - California Spatial Information Library
 Basemap, World Imagery - ESRI
 Datum - NAD1983

Date Prepared: 6/26/2014

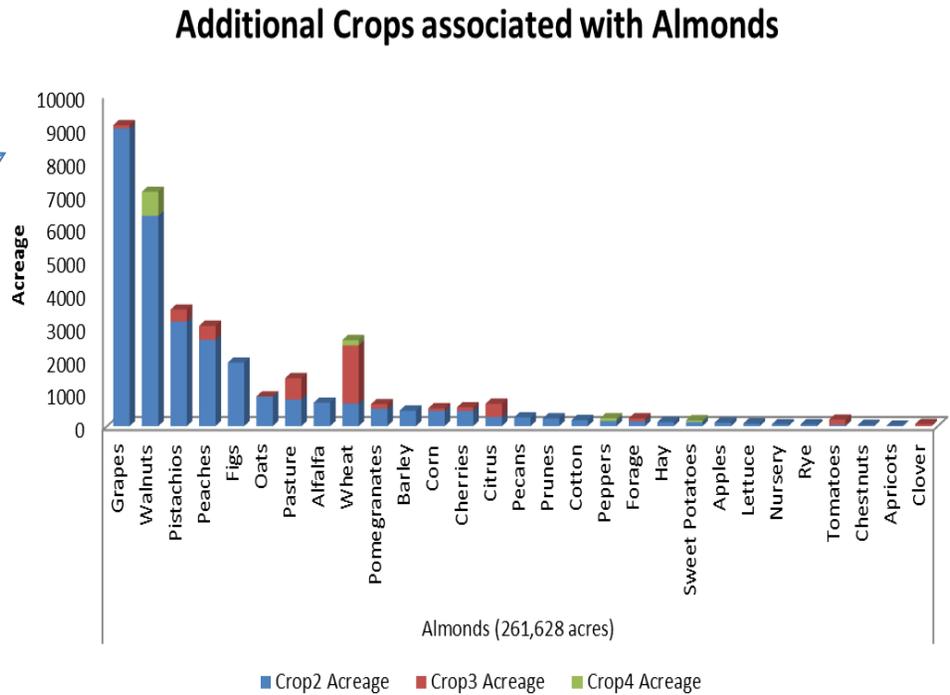
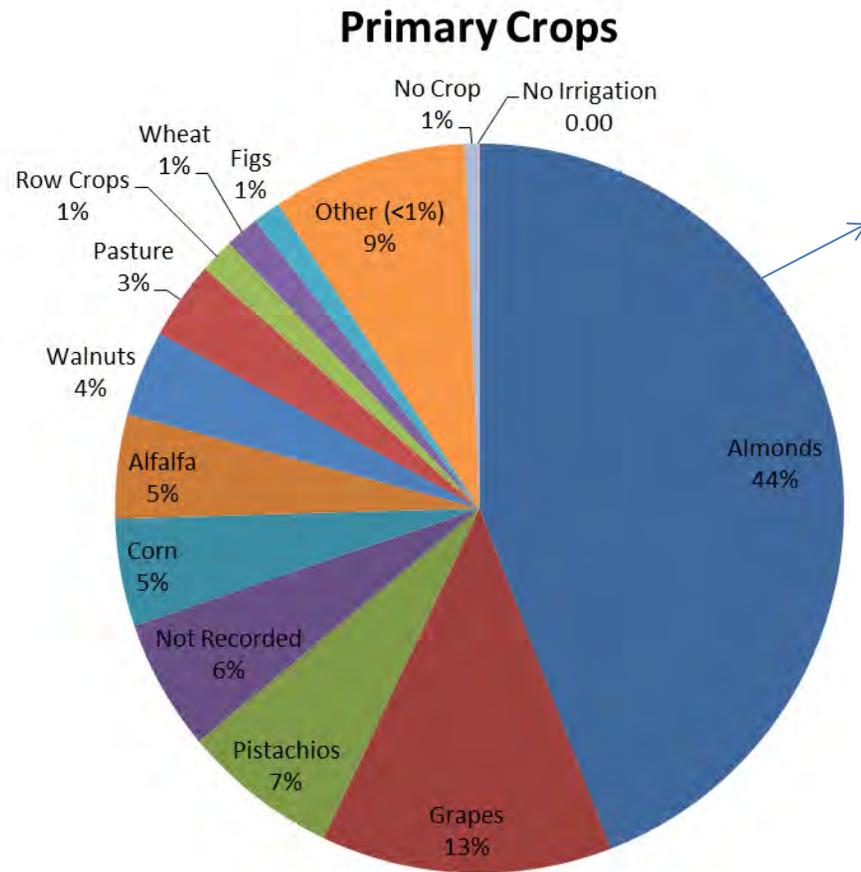


ESJWQC Member Parcels Associated with Farm Evaluation Results (2014)

ESJWQC_2014

Figure 3. Percent of acreage by primary crop (first crop listed).

In many cases there is more than one crop associated with a survey and management practices for a field.



IRRIGATION MANAGEMENT PRACTICES

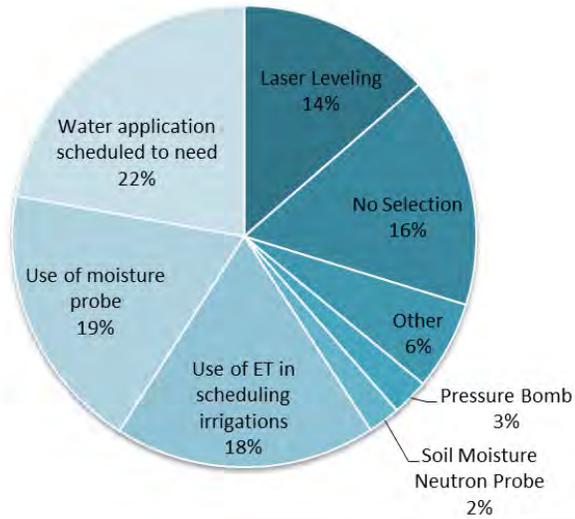
A large portion of the Coalition region has parcels with implemented practices associated with the management of irrigation. The largest acreages were associated with pressurized irrigation with flood, furrow, and sprinkler irrigation combined being used on fewer acres than drip irrigation alone. Most members utilize only a primary irrigation method (Table 4, Figure 4).

Table 4. Acreage associated with irrigation management questions and responses.

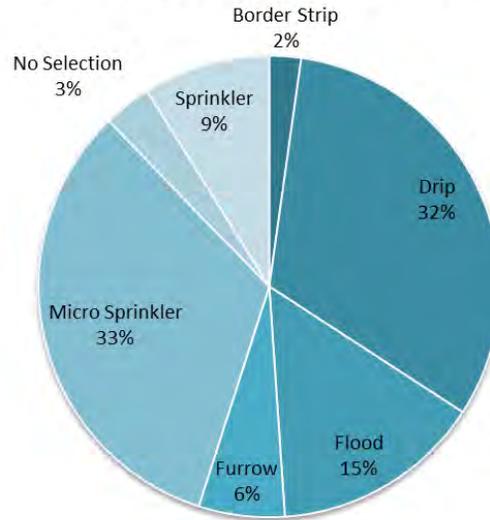
SURVEY SECTION	QUESTION	RESPONSE	ACREAGE
B	Irrigation Efficiency Practices	Laser Leveling	45,519
		Pressure Bomb	8,653
		Soil Moisture Neutron Probe	7,571
		Use of ET in scheduling irrigations	61,166
		Use of moisture probe	63,055
		Water application scheduled to need	74,509
		Other	20,933
		No Selection	54,542
		B	Primary Irrigation Practices
Drip	65,476		
Flood	30,248		
Furrow	12,354		
Sprinkler	18,235		
Micro Sprinkler	67,194		
No Selection	6,911		
B	Secondary Irrigation Practices		
		Drip	17,597
		Flood	21,433
		Furrow	6,111
		Sprinkler	7,563
		Micro Sprinkler	16,416
		No Selection	90,717

Figure 4. Percent of acreage for irrigation management practices.

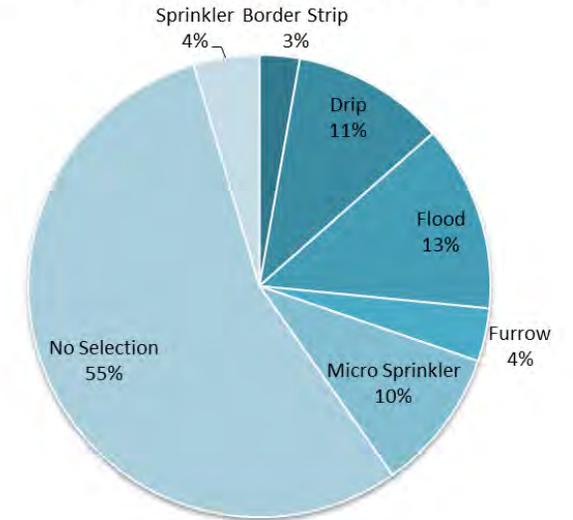
Irrigation Efficiency Practices



Primary Irrigation Practices



Secondary Irrigation Practices



SEDIMENT MANAGEMENT PRACTICES

Management of sediment is practiced by almost all members; members typically employ more than one method on a parcel as the total acreage with sediment management practices is almost 1.4 million (Table 5, Figures 5 and 6). The most common methods to reduce erosion include reduced tillage and pressurized irrigation.

Table 5. Acreage associated with sediment management practice questions and responses.

SURVEY SECTION	QUESTION	RESPONSE	ACREAGE
A	Does your farm have the potential to discharge sediment to off-farm surface waters?	No	62,752
		No Selection	45,037
		Yes	62,301
C	Cultural Practices to Manage Sediment and Erosion	Berms are constructed at low ends of fields to capture runoff and trap sediment.	44,946
		Cover crops or native vegetation are used to reduce erosion.	86,777
		Creek banks and stream banks have been stabilized.	27,871
		Crop rows are graded, directed and at a length that will optimize the use of rain and irrigation water.	58,353
		Field is lower than surrounding terrain.	35,334
		Hedgerows or trees are used to help stabilize soils and trap sediment movement.	40,183
		Minimum tillage incorporated to minimize erosion.	100,890
		No Selection for D3	14,046
		No storm drainage due to field or soil conditions.	47,620
		Sediment basins / holding ponds are used to settle out sediment and hydrophobic pesticides such as pyrethroids from irrigation and storm runoff.	39,229
		Soil water penetration has been increased through the use of amendments, deep ripping and/or aeration.	100,175
		Storm water is captured using field borders.	41,547
		Subsurface pipelines are used to channel runoff water.	44,919
		Vegetated ditches are used to remove sediment as well as water soluble pesticides, phosphate fertilizers and some forms of nitrogen.	40,494
		Vegetative filter strips and buffers are used to capture flows.	45,632
D	Irrigation Practices for Managing Sediment and Erosion	In-furrow dams are used to increase infiltration and settling out of sediment prior to entering the tail ditch.	18,295
		No irrigation drainage due to field or soil conditions.	60,998
		No Selection for D2	14,887
		PAM (polyacrylamide) used in furrow and flood irrigated fields to help bind sediment and increase infiltration.	4,616

SURVEY SECTION	QUESTION	RESPONSE	ACREAGE
		Shorter irrigation runs are used with checks to manage and capture flows.	53,244
		Tailwater Return System.	38,743
		The time between pesticide applications and the next irrigation is lengthened as much as possible to mitigate runoff of pesticide residue.	91,313
		Use drip or micro-irrigation to eliminate irrigation drainage.	100,870
		Use of flow dissipaters to minimize erosion at discharge point.	29,617
TOTAL ACREAGE			1,383,829

Figure 5. Acreage of cultural practices implemented to manage sediment and erosion.

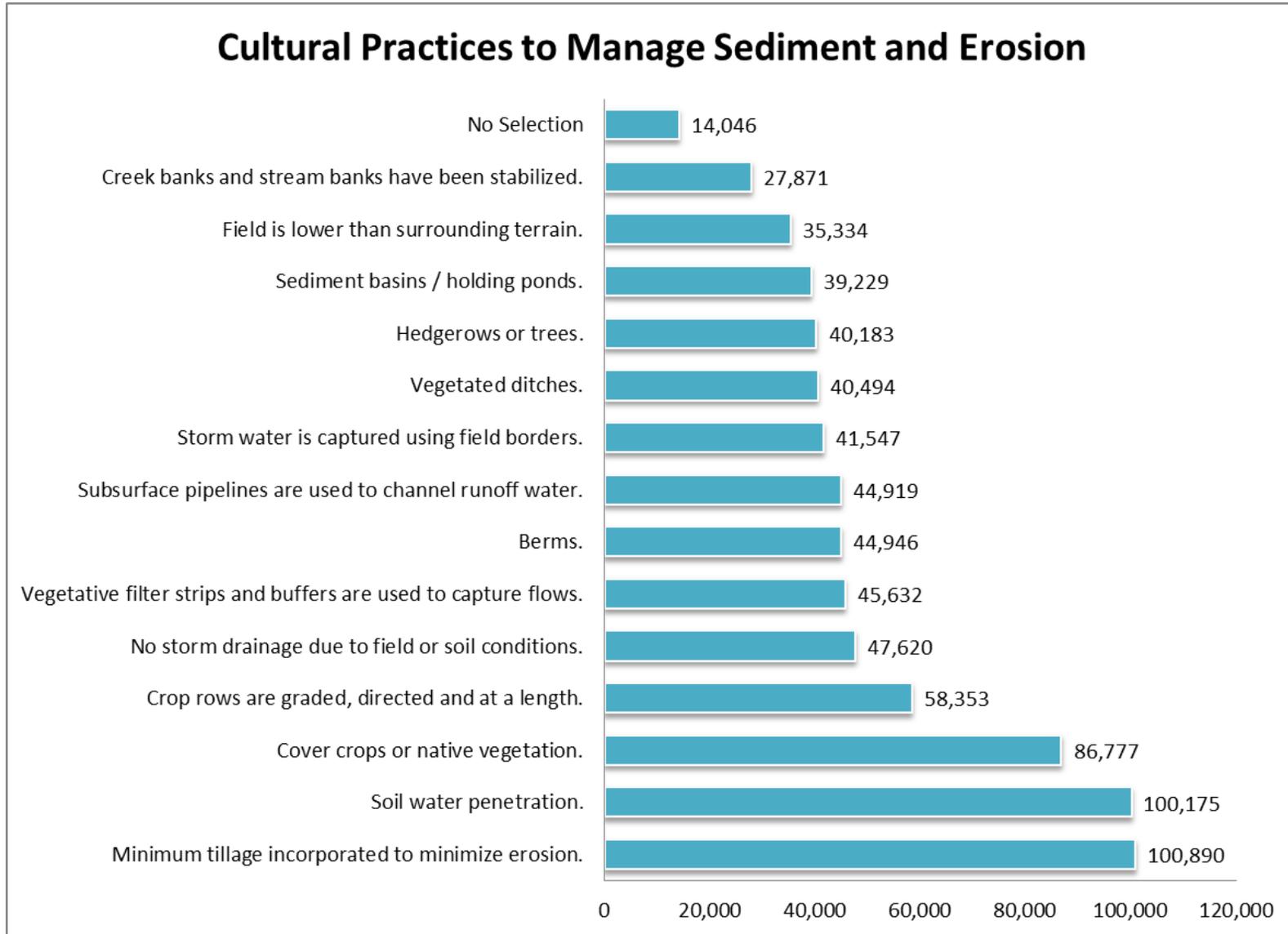
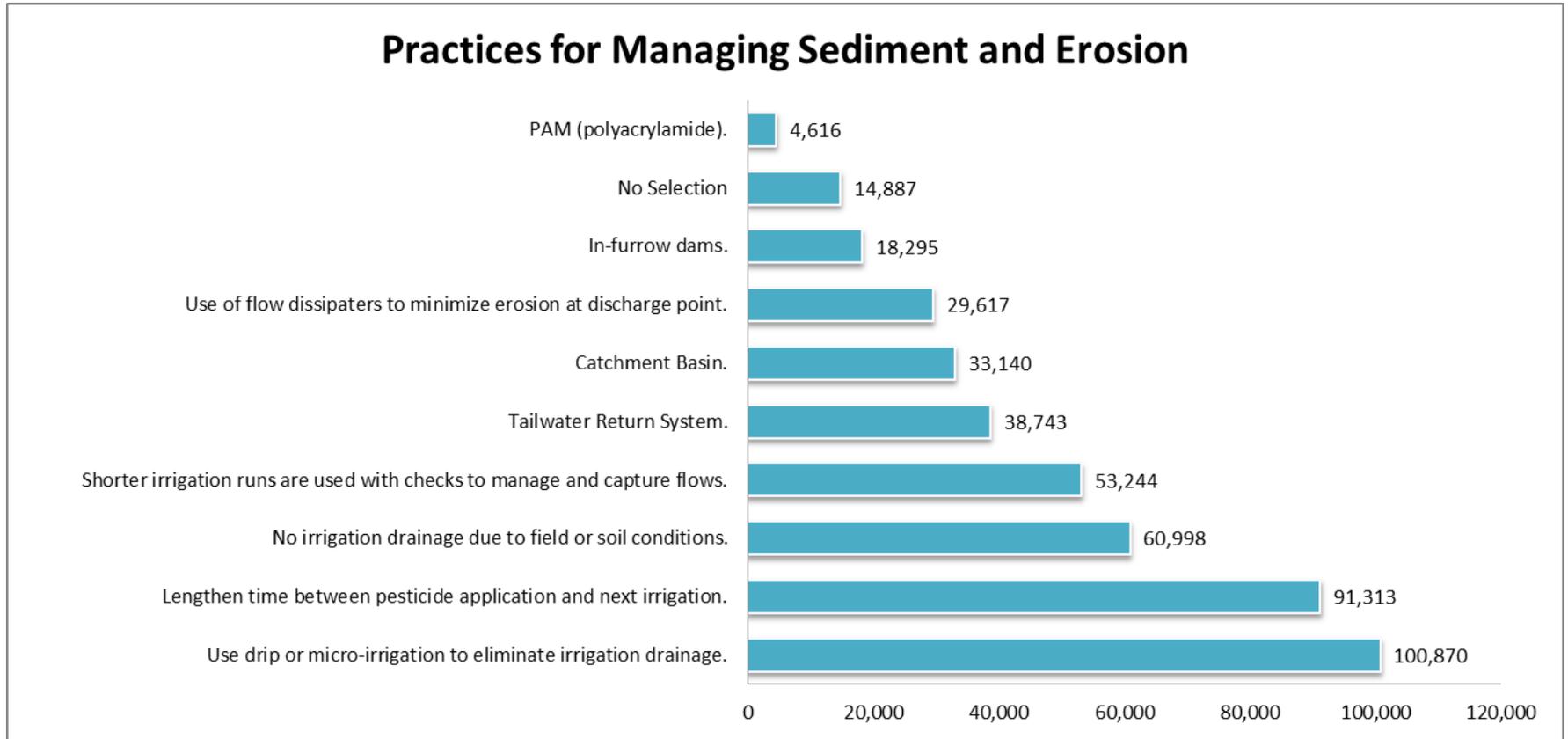


Figure 6. Acreage of practices implemented to manage sediment and erosion.



PESTICIDE & NUTRIENT MANAGEMENT

The largest number of management practices is associated with pesticide and nutrient management indicating that members employ several practices to reduce the movement of pesticides and nutrients to surface waters (Table 6, Figures 7-9). No single pesticide management practice was used more than others; the relative consistency among practices with respect to the acreage on which they are used indicates that members may employ as many as 8 to 10 practices to manage pesticide applications. The majority of members engage a professional in nutrient management to prepare their fertility plan. Most members report splitting fertilizer applications as well as performing soil and tissue testing to guide fertilizer applications.

Table 6. Acreage associated with pesticide application practices question and answers.

SURVEY SECTION	QUESTION	RESPONSE	ACREAGE
A	Pesticide Application Practices		
		Attend Trainings	123,152
		Avoid Surface Water When Spraying	125,807
		Chemigation	92,180
		County Permit Followed	126,802
		End of Row Shutoff When Spraying	122,375
		Follow Label Restrictions	126,920
		Monitor Rain Forecasts	122,184
		Monitor Wind Conditions	126,517
		Reapply Rinsate to Treated Field	101,951
		Sensitive Areas Mapped	91,820
		Target Sensing Sprayer used	47,714
		Use Appropriate Buffer Zones	114,170
		Use Drift Control Agents	112,100
		Use PCA Recommendations	125,841
		Use Vegetated Drain Ditches	59,327
		Other1	24,146
		Other2	535
		No Pesticides Applied	11,640
		No Selection	5,066
A	Who do you have help develop your crop fertility plan?		
		Certified Crop Advisor (CCA)	83,441
		Certified Technical Service Providers by NRCS	14,926
		Independently Prepared by Member	31,181
		Pest Control Advisor (PCA)	121,994
		Professional Agronomist	60,529
		Professional Soil Scientist	56,620
		UC Farm Advisor	46,406
		No Selection	5,317
		None of the above	8,890
B	Nitrogen Management Methods to Minimize Leaching Past The Root Zone		
		Cover Crops	51,436

SURVEY SECTION	QUESTION	RESPONSE	ACREAGE
		Fertigation	64,884
		Foliar N Application	60,359
		Irrigation Water N Testing	57,351
		Soil Testing	71,338
		Split Fertilizer Applications	71,721
		Tissue/Petiole Testing	71,185
		Variable Rate Applications using GPS	19,047
		Other	11,033
		Other2	1,956
		No Selection	45,398
		TOTAL ACREAGE	2,615,259

Figure 7. Percent acreage associated with professionals qualified to develop crop fertility plans.

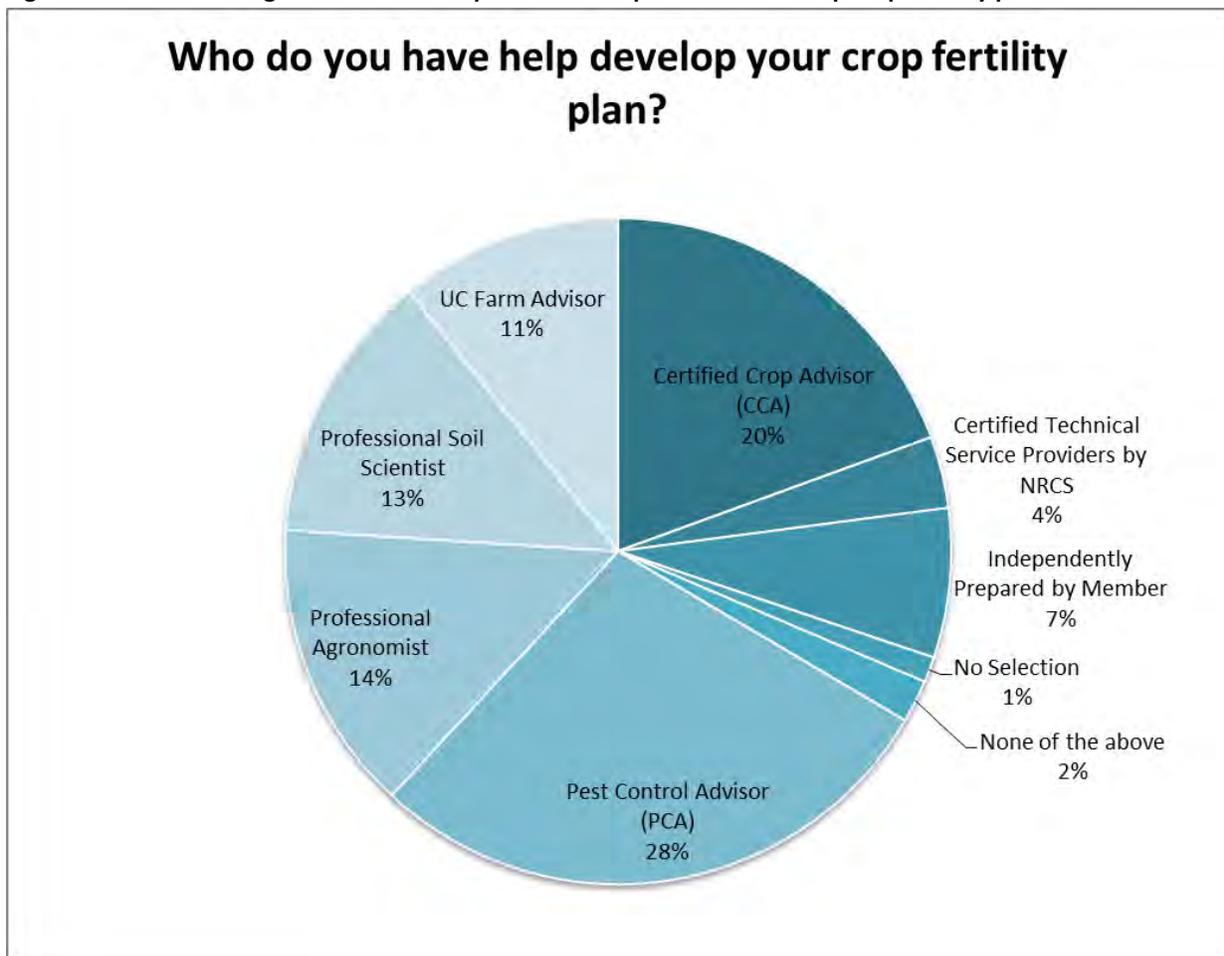


Figure 8. Acreage associated with pesticide application practices.

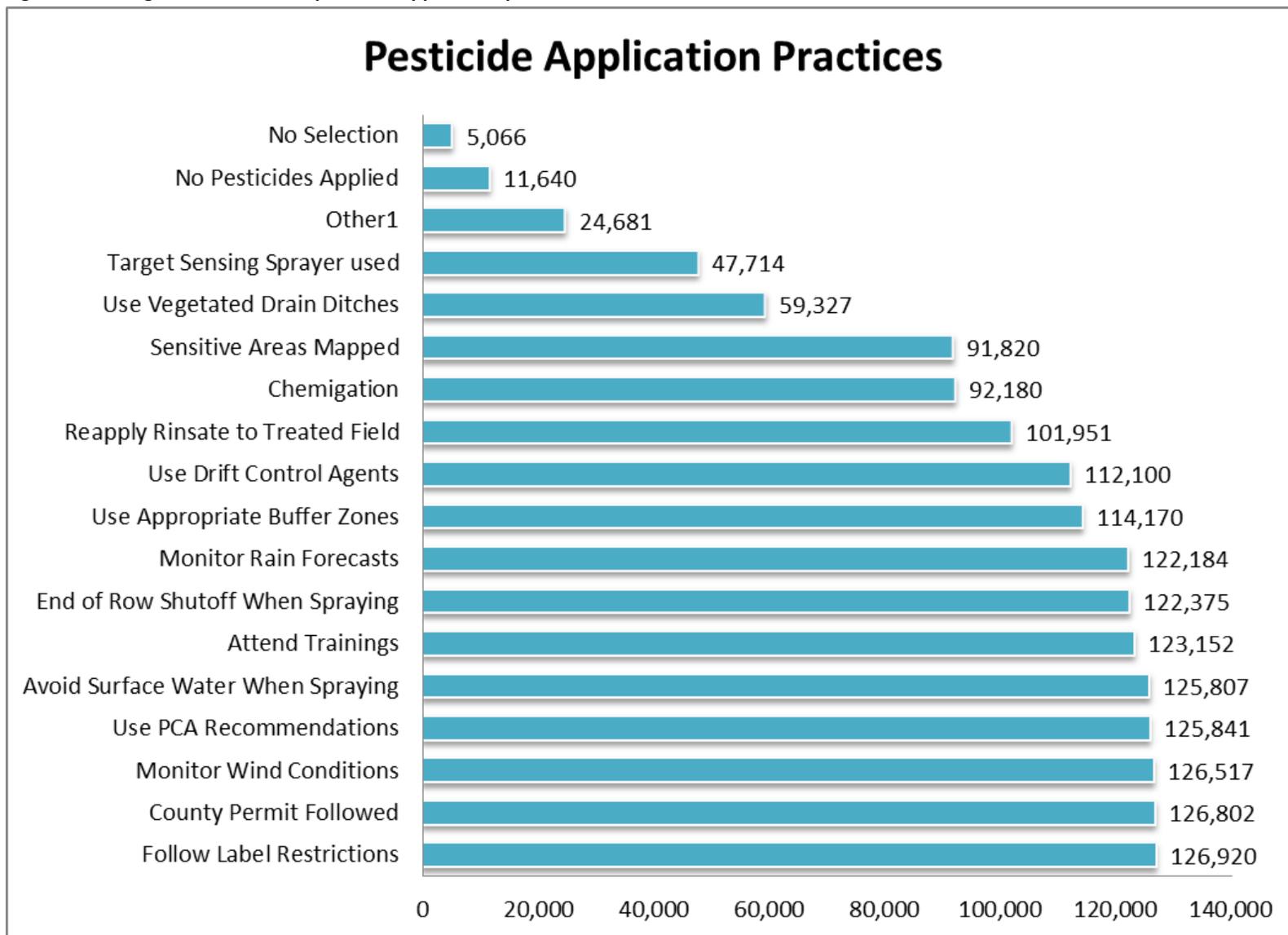
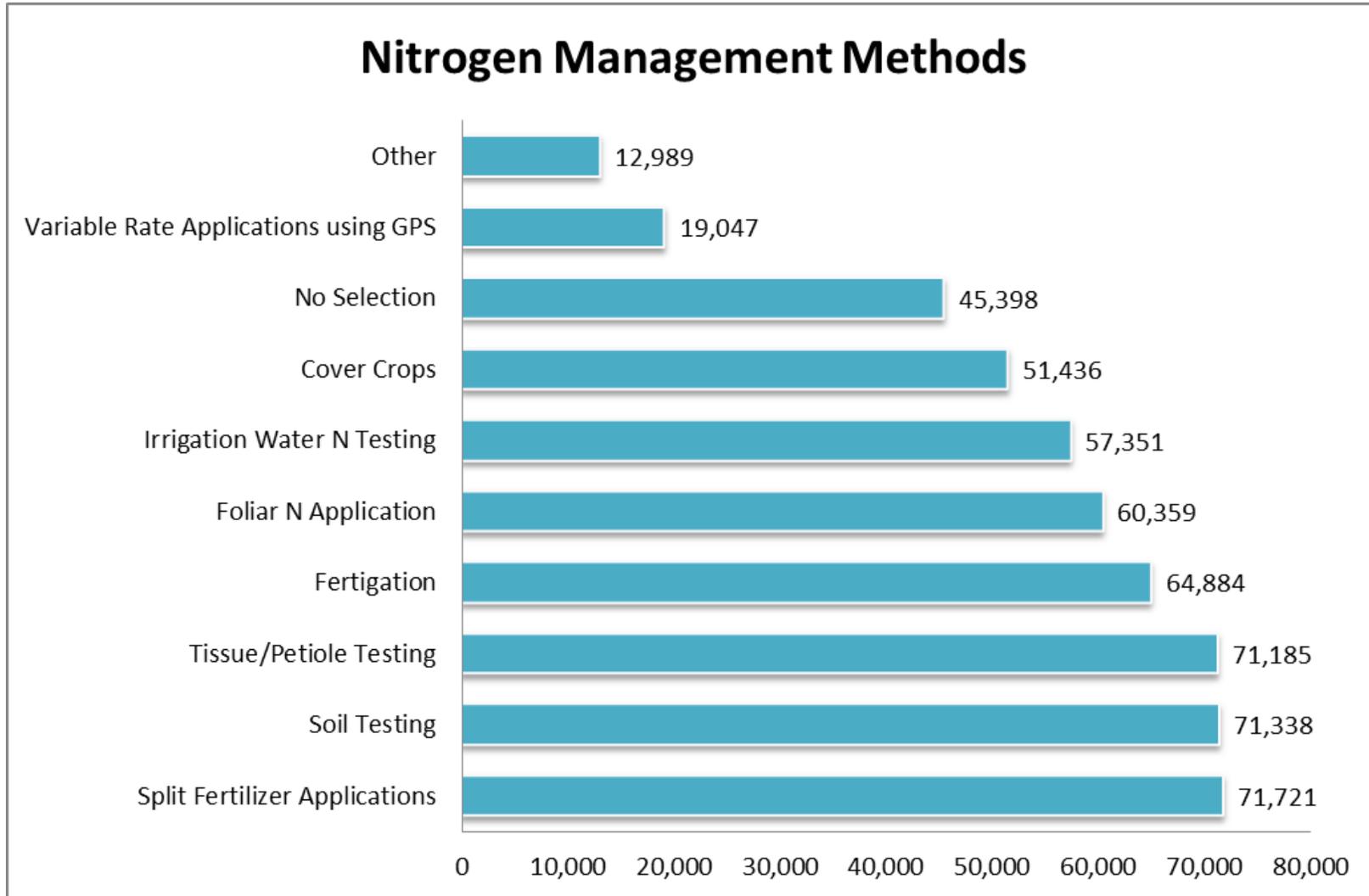


Figure 9. Acreage associated with nitrogen management methods.



WELL MANAGEMENT PRACTICES

Irrigation Wells

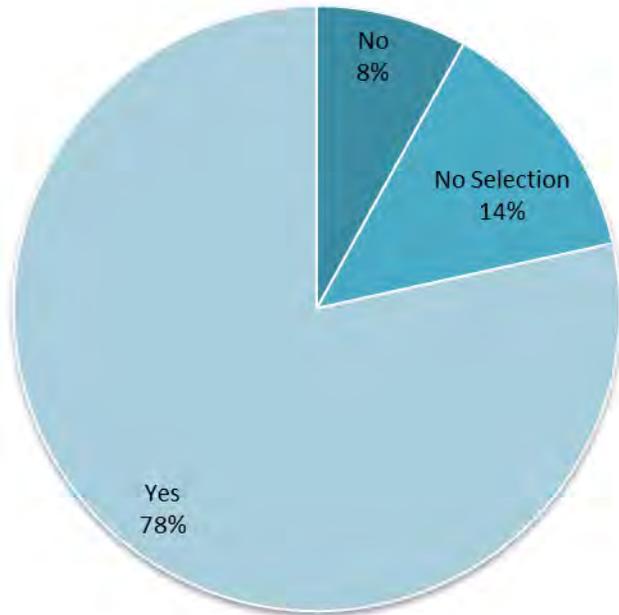
The majority of the parcels had at least one irrigation well (Table 7, Figure 10). The Coalition region contains many abandoned wells, a large portion of these abandoned wells have been properly destroyed (Table 8, Figure 11). The number of wells abandoned over the years has fluctuated and appears to bear no relationship to any environmental variable although a thorough analysis was not conducted (Table 9).

Table 7. Acreage associated with wellhead protection practices.

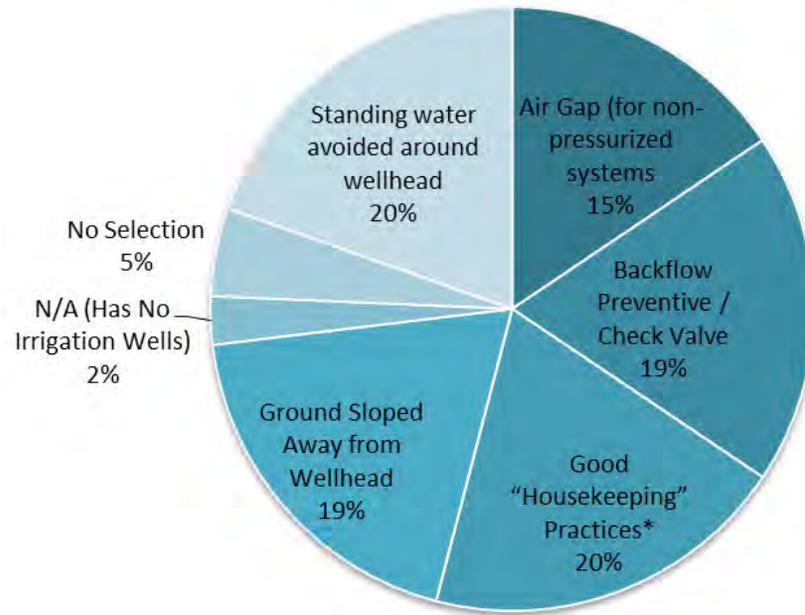
SURVEY SECTION	QUESTION	RESPONSE	ACREAGE
C	Do you have any irrigation wells on parcels associated with this Farm Evaluation?		
		Yes	108,716
		No	11,189
		No Selection	18,679
C	Wellhead Protection Practices		
		Air Gap (for non-pressurized systems	86,930
		Backflow Preventive / Check Valve	105,207
		Good "Housekeeping" Practices*	109,742
		Ground Sloped Away from Wellhead	106,289
		N/A (Has No Irrigation Wells)	14,408
		No Selection	26,408
		Standing water avoided around wellhead	109,406
		TOTAL ACREAGE	696,974

Figure 10. Percent acreage associated with members who have irrigation wells and members implementing wellhead protection practices.

Do you have any irrigation wells?



Wellhead Protection Practices



Abandoned Wells

Table 8. Acreage associated with abandoned well practices.

SURVEY SECTION	QUESTION	RESPONSE	ACREAGE
C	Are you aware of any known abandoned wells associated with this Farm Evaluation?	No	68993
		No Selection	50235
		Yes	37406
		TOTAL ACREAGE	323,345
C	Abandoned Well Practices	Destroyed – certified by county	7,344
		Destroyed - Unknown method	15,266
		Destroyed by licensed professional	13,571
		N/A (Has No Abandoned Wells)	70,214
		No Selection	60,316
		TOTAL ACREAGE	323,345

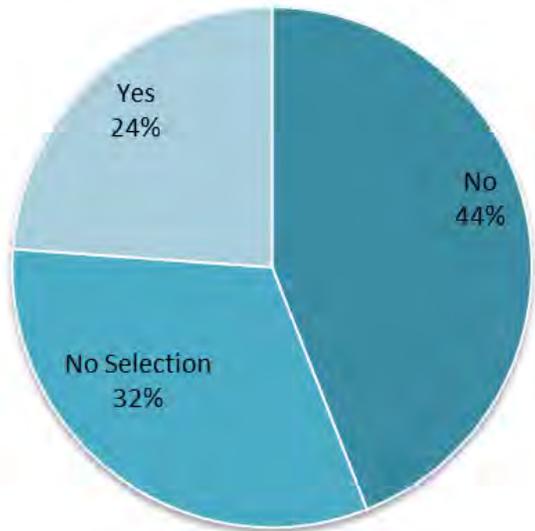
Table 9. Count of wells abandoned in specific years.

SURVEY SECTION	QUESTION	RESPONSE	COUNT OF WELLS
C	Well Abandoned (Year)	1962	1
		1967	5
		1968	8
		1970	2
		1971	6
		1975	5
		1976	1
		1978	2
		1988	7
		1989	36
		1990	8
		1991	16
		1994	5
		1995	36
		1998	2
		2000	13
		2001	17
		2002	5
		2003	9
		2004	6
		2006	3
		2007	10
		2008	10
		2009	5
2010	38		
2011	1		
2012	26		

SURVEY SECTION	QUESTION	RESPONSE	COUNT OF WELLS
		2013	6
		2014	5
		Unknown	40
TOTAL COUNT OF WELLS			334

Figure 11. Percentage of acreage with abandoned wells and practices associated with those wells.

Are you aware of any known abandoned wells?



Abandoned Well Practices

Destroyed – certified by county 5%

