SAN JOAQUIN VALLEY GROWER IRRIGATION SURVEY

Report prepared by
The Center for Irrigation Technology
in cooperation with the
US Bureau of Reclamation

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A total of 2500 surveys were sent out to randomly selected growers in the San Joaquin Valley. Nearly 18% of those growers (445) responded. The results are as follows:

Question 1

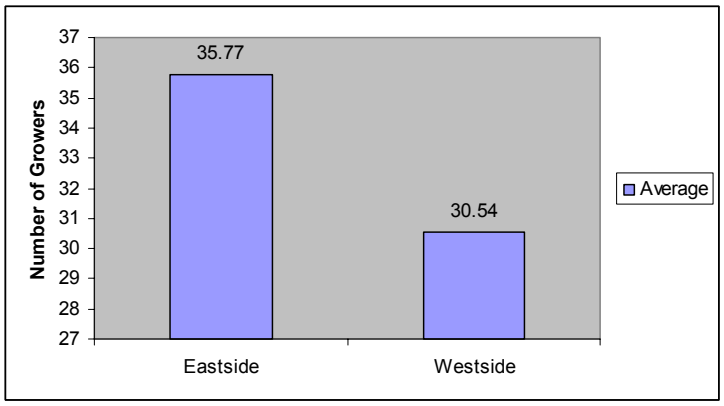
Do you primarily farm on the Eastside or Westside?

There were 219 farmers located on the Eastside. The Eastside is defined as the western slopes of the Sierra Nevada Mountains, east of state highway 99 along the San Joaquin Valley. There were 226 farmers located on the Westside. The Westside is considered west of highway 99 and east of the coastal foothills along the San Joaquin Valley.

Question 2

How many years have you been farming?

As shown in the following graph, growers on the Eastside have been farming, on average, for about 5 more years than those on the Westside.

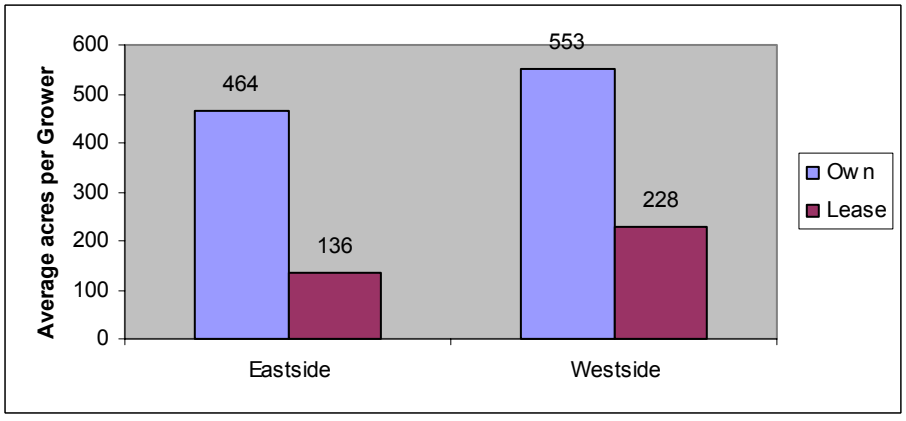


Question 3

A. How many Acres do you own?

B. How many acres do lease?

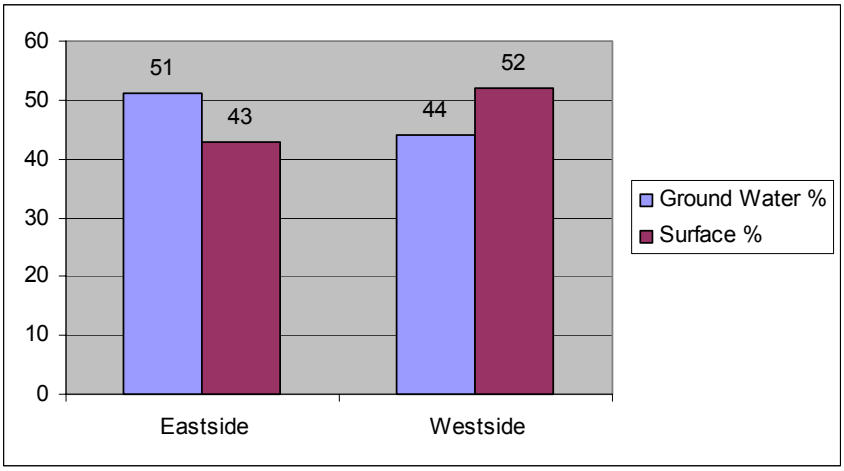
In the following graph you can see a comparison between the average acres owned and the average acres leased in the two regions. The Westside growers have a larger average of both owned and leased land.



Question 4

In an average year what percentage of your water is supplied by groundwater and surface sources?

The results show Westside growers use more surface water than those on the Eastside, but the opposite is true for groundwater sources, with Eastside growers using more.



Name of your irrigation district

The following table gives you an idea of how many growers responded from each of the surrounding irrigation districts.

Irrigation Districts	
Irrigation District	**Number of Growers**
Fresno Irrigation District	82
Consolidated Irrigation District	45
Alta	27
Madera	23
Westlands	22
Lindmore	12
Stockton East	12
Lower Tule	9
Ivanhoe	9
People's Ditch Co.	8
Turlock	8
Exeter	7
Raisin City	7
Central California	7
Bakersfield	7
Orange Cove	6
Chowchilla	6
Merced/Gravely Ford	6
Saucelito	6
South San Joaquin	5
Laguna	5
San Luis	4

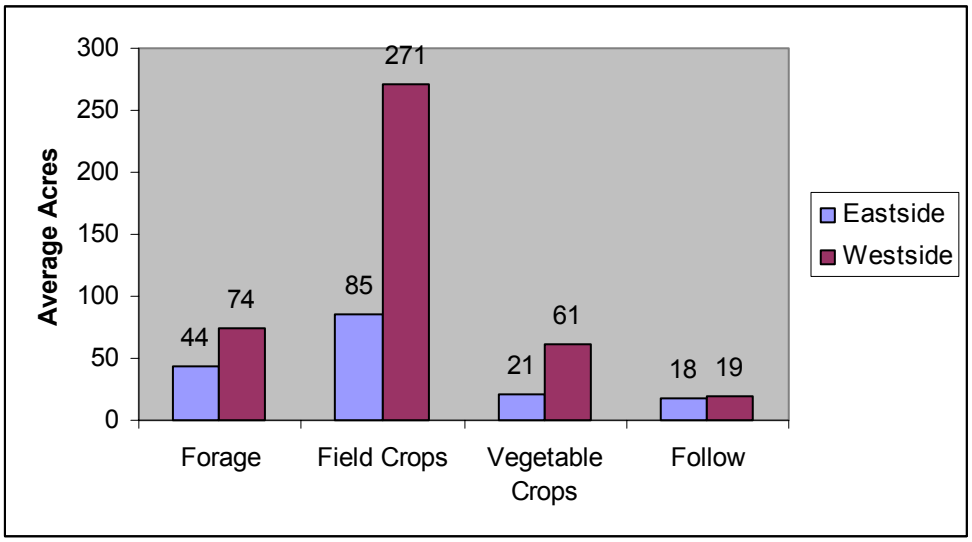
Irrigation Districts	
Irrigation District	Number of Growers
Modesto	4
Woodbridge	4
Lakeside	4
MID	3
CCID	3
Kaweha Delta	3
Delano	3
DEID	3
Liberty Mill Race Stinson Canal	3
Tulare	3
Riverdale	3
Teapot Dome	3
San Joaquin	3
Terra Bella Irrigation District	3
Firebaugh Canal	2
TBID	2
Corcoran	2
TID	2
SSJMUD	2
Lemoore Canal	2
SSJID	2
Shafter Wasco ID	2
Tranquility	2
Stone Canal	2
Banta Carbona	2
Oakdale & Modesto	2
OID	2
Arvin Edison	2
Sacramento	2
NONE	2
Terre Bella	2
Alpaugh	1
Wheeler Ridge Water Storage District	1
EID/CID	1
EID	1
Delano-Earlimart	1
CWD	1
Clarks Fork Reclamation	1
Ballico Cortez	1
Boutuville	1
Broadview-Westlands	1
Columbia Canal	1
CLID	1
Buena Vista	1
Vandalia	1

Irrigation Districts	
Irrigation District	**Number of Growers**
Buena Vista Water District	1
Cawelo	1
West Stanislaus	1
Semi-Tropic	1
Riparian Water	1
Root Creek	1
Private Well	1
Porterville	1
Pixley	1
Persian Watson	1
Patterson & Westlands	1
Panoche	1
Pajaro Valley Water Management	1
North San Joaquin Water Conservation District	1
San Luis Canal	1
James Irrigation District	1
Stratford Irrigation District	1
Sentinel Butte Mutual	1
LTRD	1
Sentinel Butte Mutual Water Co.	1
Lindsay	1
Stinson- Kings River	1
KTWD	1
Kings River	1
Kings Co. Water District	1
Kern Tulare - Terra Bella	1
Kern Delta	1
Merced	1
James	1

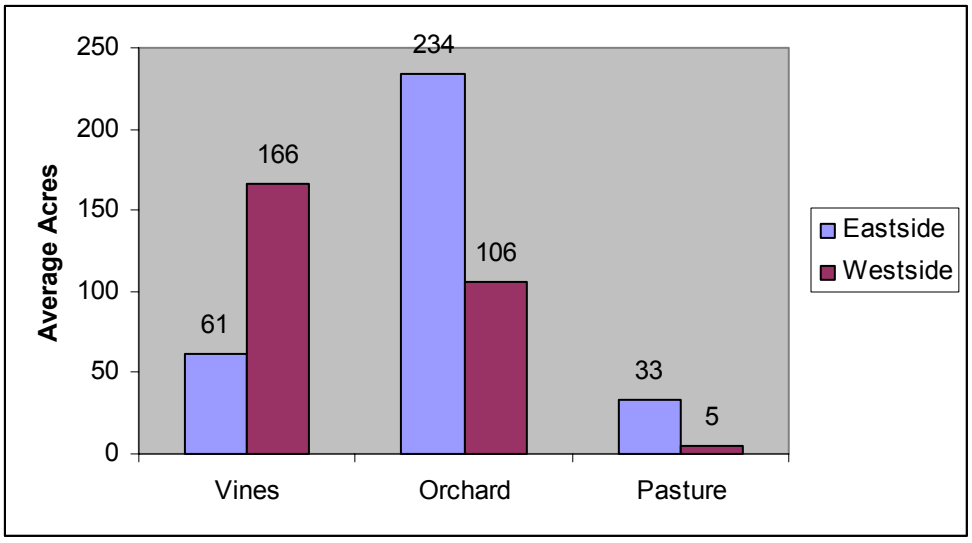
Question 5

What is your current cropping pattern?
Westside growers produce more annual crops and Eastside growers produce more permanent crops.

ANNUAL:

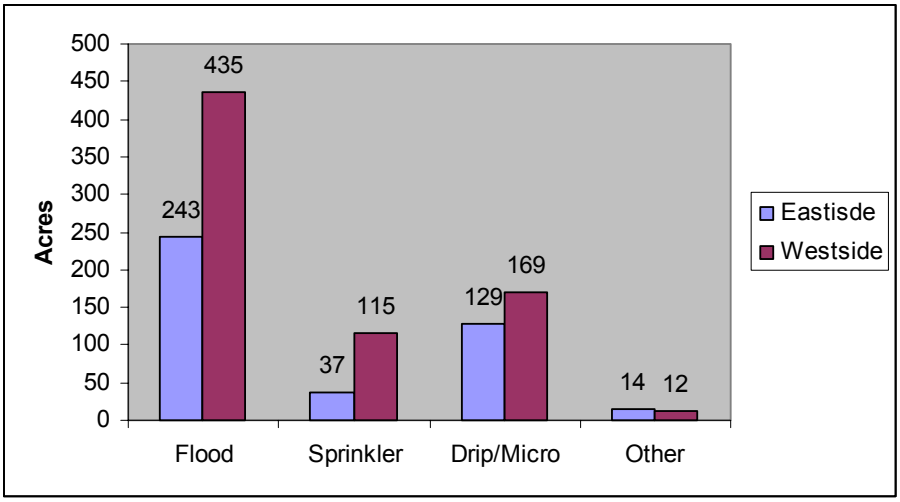


PERMANENT:



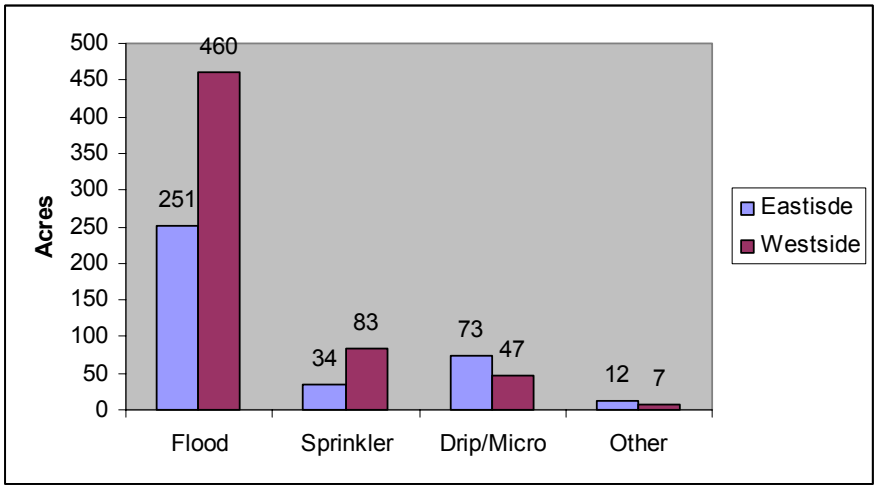
Question 6

How many acres do you currently have under the following irrigation systems?
Currently, 59% of irrigation is by the flood method. The majority of this is on the Westside. Drip/micro is the second most popular method at 26%.



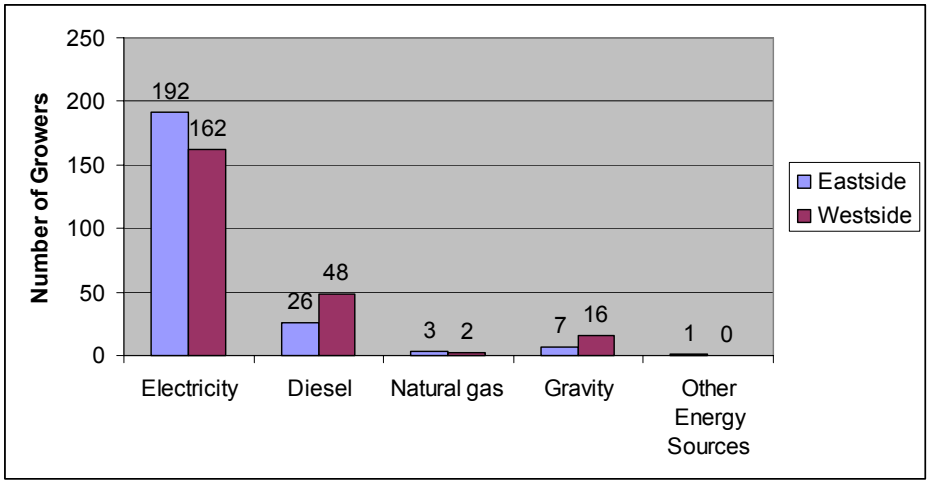
Question 7

How many acres did you have under the following irrigation systems 10 years ago? (If applicable.)
Ten years ago flood accounted for 74% of irrigation systems in both areas, followed by drip/micro at 12%.



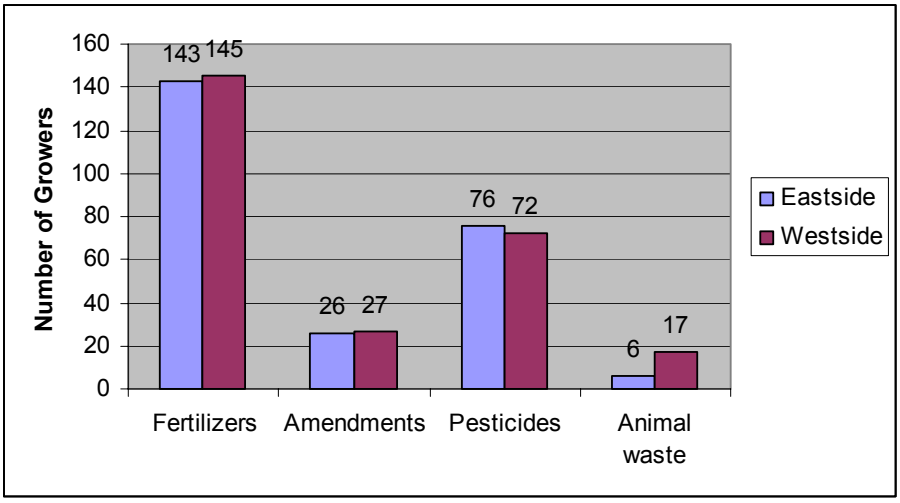
Question 8

What is the main energy source you use for pumping?
The most common energy source in both areas was electricity, with diesel following as a distant second.



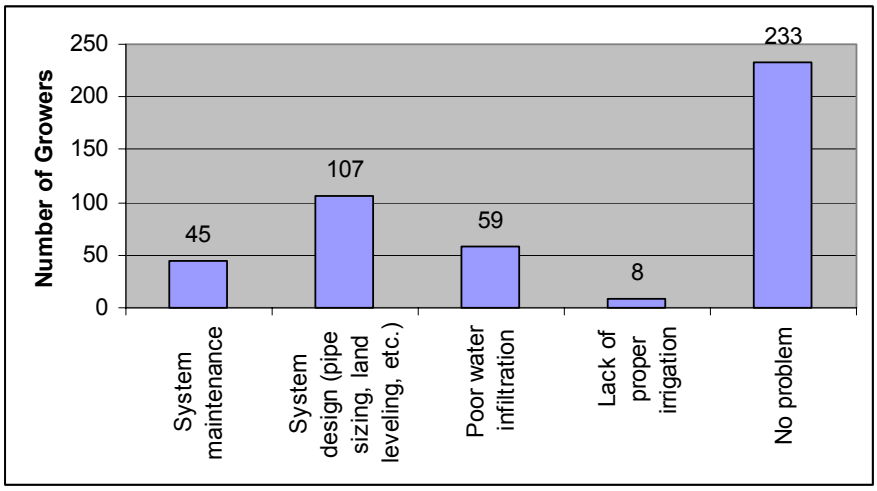
Question 9

Do you practice chemigation (injecting chemicals into the irrigation water)?
Fertilizer is the leading material used in chemigation systems for both geographic areas followed by pesticides.



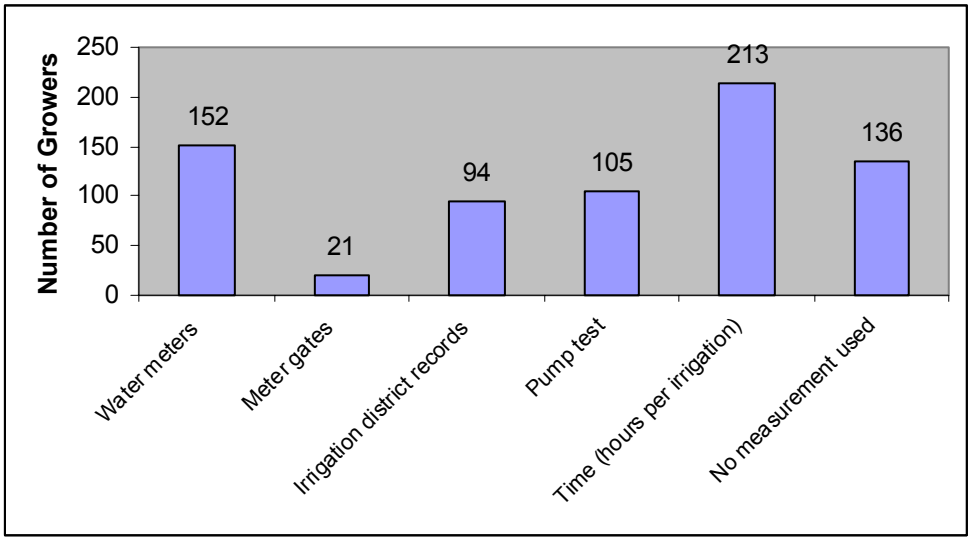
Question 10

<u>If you have a problem applying irrigation water uniformly, what do you feel is the primary cause?</u>
More than half of the participating growers believe they do not have any problem applying irrigation water uniformly. One fourth of the growers believe that the primary cause of the problem is system design.



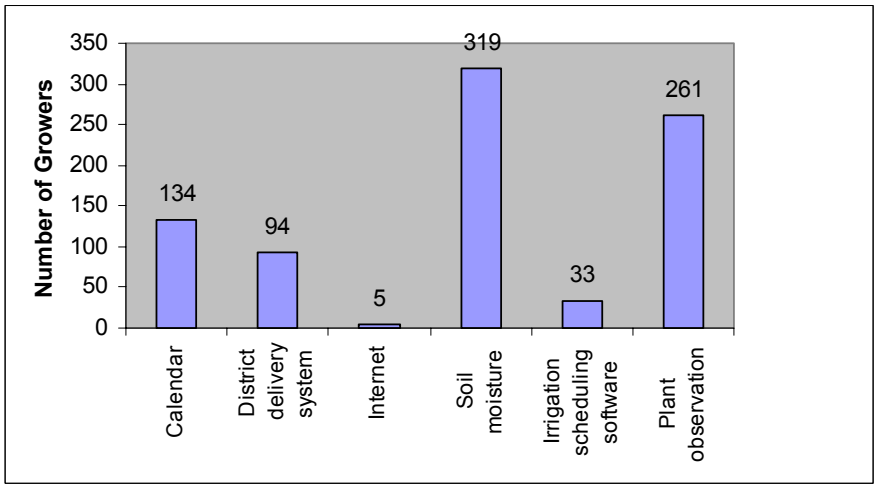
Question 11

<u>Are you using any flow measuring methods to find out how much water you are applying with each irrigation?</u>
The leading method reported by growers is "time" (nearly half of the respondents) followed by water meters and no measurement used.



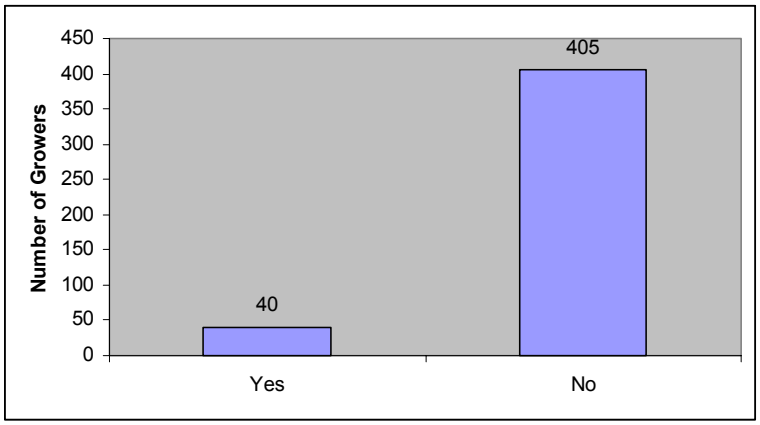
Question 12

Do you schedule your irrigations by: *(Check all that apply.)*
Three out of four growers reported that they schedule irrigation events by soil moisture, two of four reported plant observation and one of four reported using the calendar.



Question 13

Does water quality affect your decision on when to irrigate and how much water to apply?
More than 90% of the growers are not influenced by the quality of water when they irrigate.



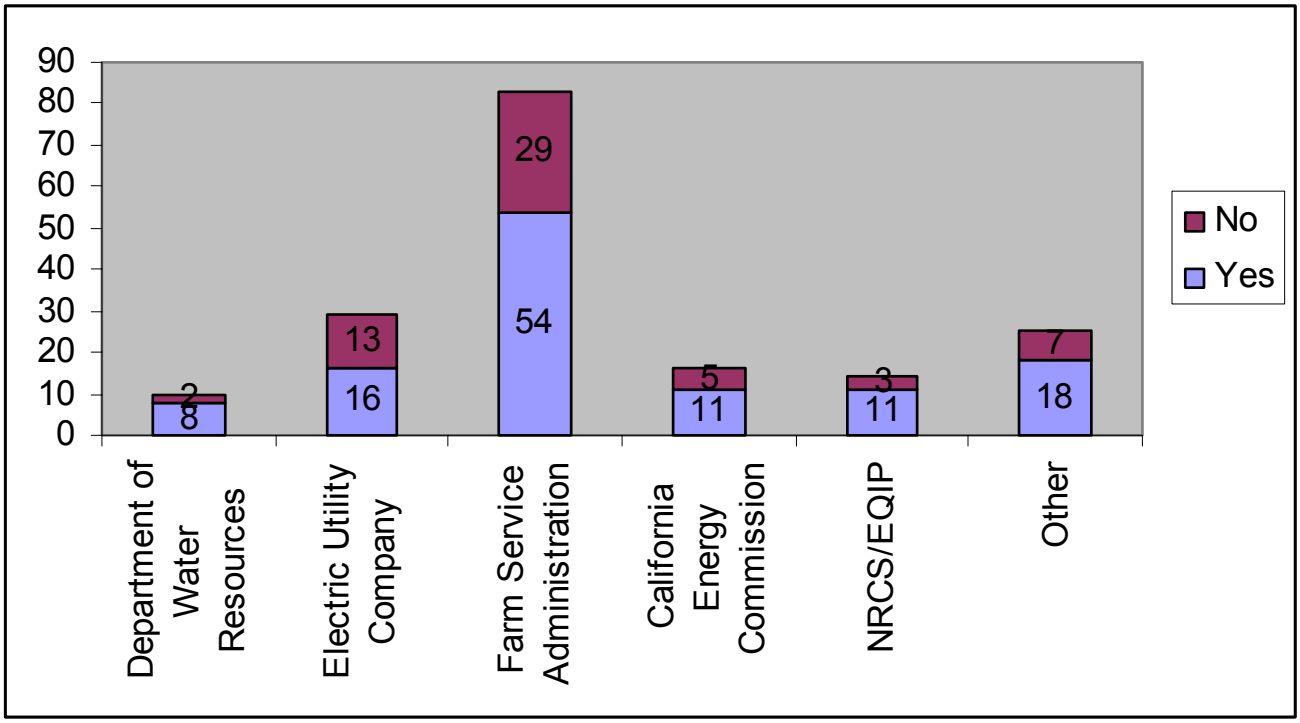
Question 14

Have you made use of available financial assistance offered through government agencies for irrigation system improvement or management?
This question was cross tabulated with number 15 giving the following outcome.

Question 15

If you answered yes to question 14, was financial assistance critical to making these improvements to your irrigation system or management practices?
This question was cross tabulated with number 14 giving the following outcome.

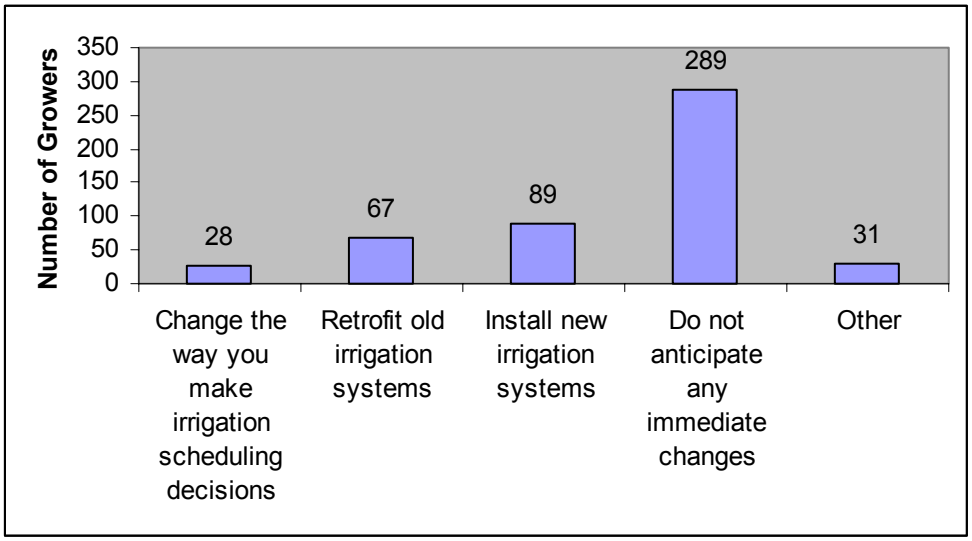
The above questions were combined to arrive at the following conclusion. The graph shows how many growers have used the services of the agencies and of those how many were (yes) or were not (no) satisfied with the services.



Question 16

Do you anticipate any immediate improvements to your irrigation systems or water management capabilities? *(Check any that apply.)*

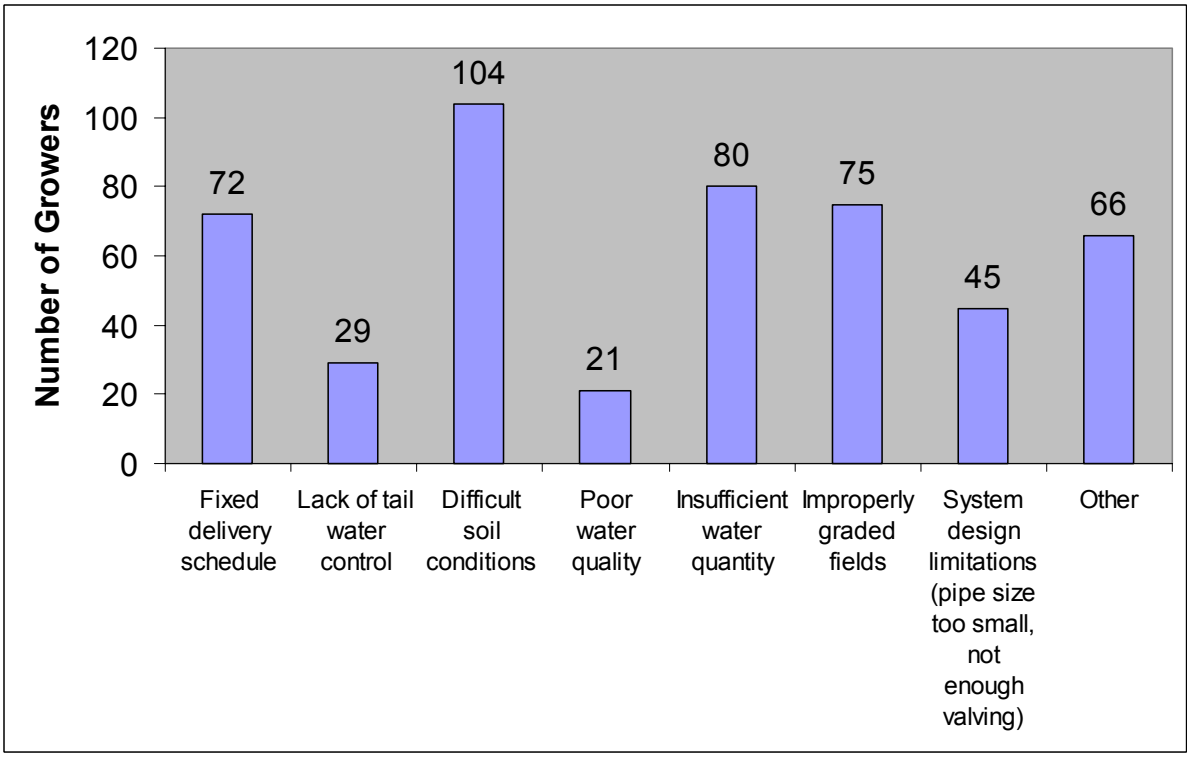
About 70% of the growers reporting do not anticipate any immediate changes to improve the irrigation systems. The majority who will make changes identified new systems.



Question 17

Do you have any special factors that impact your ability to irrigate effectively and profitably, such as: *(Check any that apply.)*

The three leading factors affecting the ability of the growers to irrigate are difficult soil conditions followed closely by insufficient water quality and then improperly graded fields.



Question 18

What improvements would you make to your irrigation systems if you had a zero interest or low interest loan? *(Number in order of importance with 1 being the most important. Use N/A for any that do not apply.)*

171 respondents chose "Install drip/micro" with an average ranking of 1.
158 respondents chose "Improve Water Supply" with an average ranking of 2.
123 respondents chose "Land Leveling" with an average ranking of 2.
109 respondents chose "Attend Educational and Training" with an average ranking of 3.
64 respondents chose "Install Sprinklers" with an average ranking of 3.
57 respondents chose "Install a tail water recovery system" with an average ranking of 4.
67 respondents chose "Hire a water management consultant" with an average ranking of 4.
28 respondents chose "Install a mechanical move system" with an average ranking of 4.

Question 19

What are your sources of information on irrigation systems and water management? *(Number in order of importance with 1 being the most important. Use N/A for any that do not apply.)*

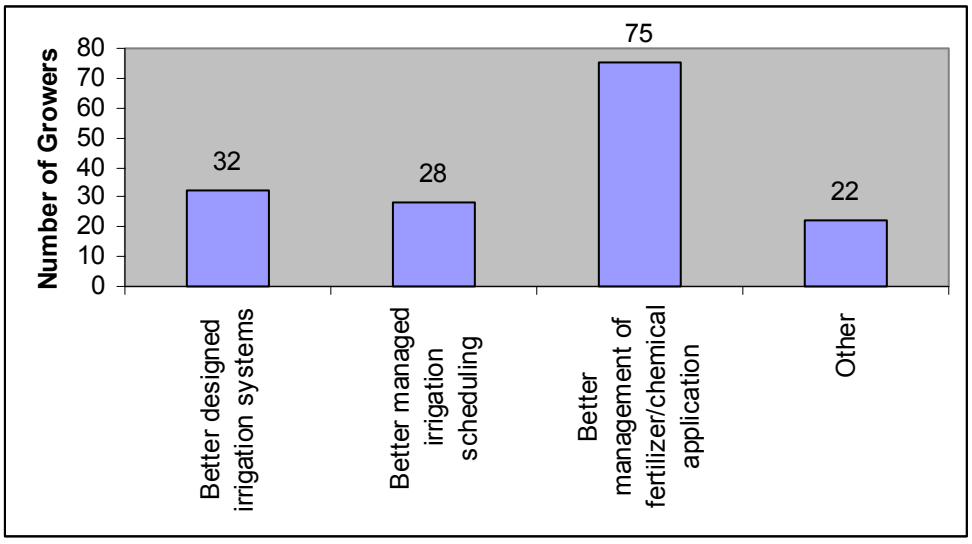
225 chose "Irrigation dealer" with an average ranking of 2
188 chose "Irrigation consultants" with an average ranking of 2
215 chose "Neighbors" with an average ranking of 3
168 chose "Tradeshows" with an average ranking of 3
160 chose "UC extension/Irrigation Training & Research Center, Cal Poly" with an average ranking of 3
121 chose "The Center for Irrigation Technology/CATI" with an average ranking of 4
93 chose "Internet" with an average ranking of 5

Question 20

Is ground or surface water contamination from farming a concern in your area?

☐ Yes ☐ No If yes, what farming practices should be changed? *(Check all that apply.)*

About 40% of the participating growers said that water contamination is a big concern in their area with 75 growers believing that better management of fertilizer/chemigation application should be addressed.



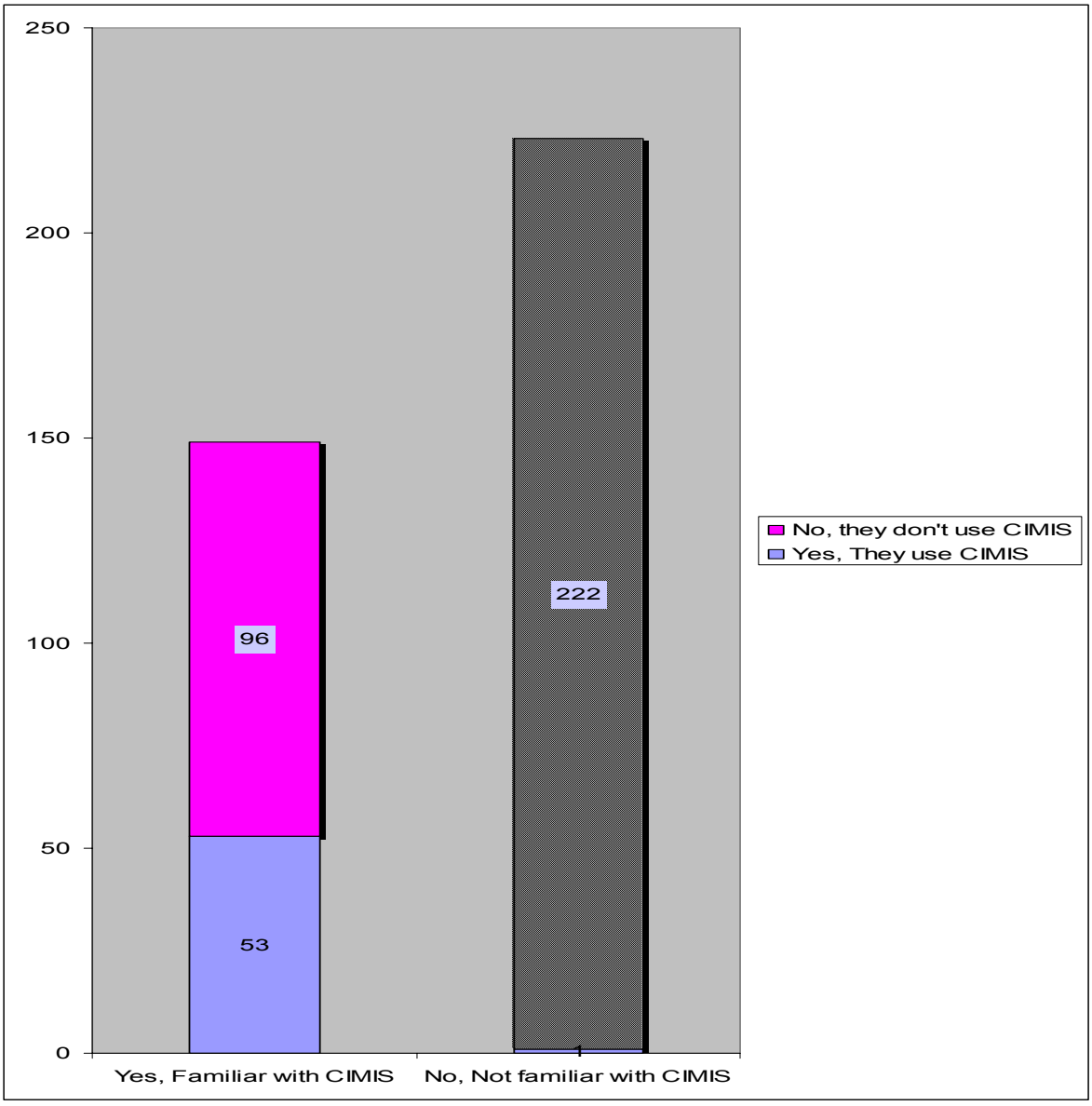
Question 21

A. - Are you familiar with the CA Irrigation Management Information System (CIMIS)?

B. - Do you use CIMIS in your water management activities?

Question 21A was cross tabulated with question 21B

The first bar shows how many growers are familiar with CIMIS and of those it shows how many actually use it.

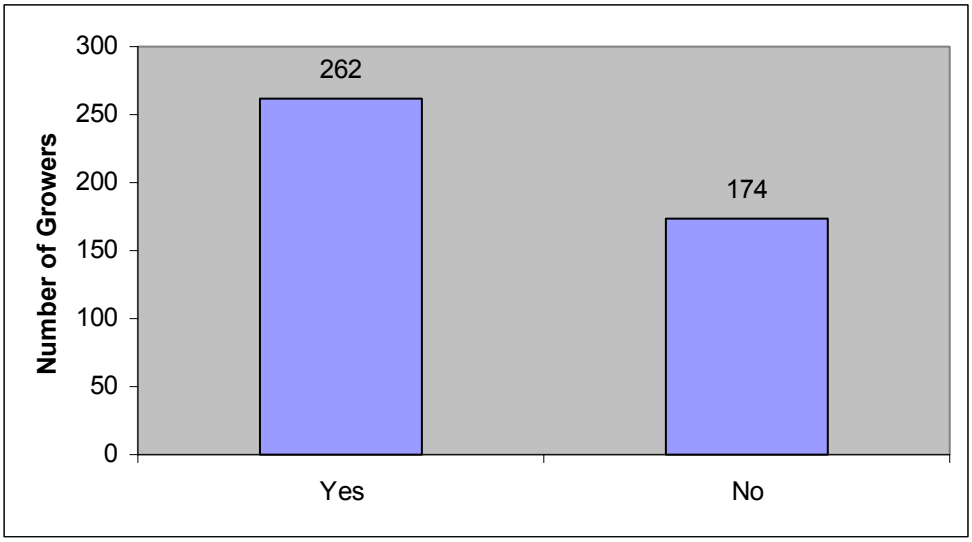


Question 22

Do you irrigate as efficiently (considering uniformity and management) as you think you could?

☐ Yes ☐ No If no, what one thing would you do to improve it?

About 60% (262) of the participating growers responded yes. Forty percent (174) of the growers responded no and provided the following list of ways to improve irrigation efficiency.



Soil pattern different in every field.
Improve system efficiency drip.`
Spend more money on management and labor
On same of my land I still flood irrigate.
Would like to have a better scheduling system
Sprinklers
Improve water - penetration and scheduling
Better leveling of fields
Convert all floods to drip/micro. Use ET data.
Convert to drip/micro.
? Must be something
No improvements needed
Tail water system
Drip system
Install micro sprinklers on sandy soils
Better instruments for measuring soil moisture.
Everything under drip
More surface water availability.
Might convert a few more fields to drip.
Install more drip systems
Monitor soil moisture more efficiency, during peak crop development.
Need easy to get and easy to understand info.
Leveling and return system
Replace system
Replace "Flood" with "Drip" on 75 acres.
Get an irrometer
Install a soil moisture monitoring system
Get better rodent control near clubs & river.
We do not irrigate
Install more micro sprinklers and drip
Train employees
Land leveling
Pump in between FID irrigation
Need a different system to be more efficient
More closely monitor it & put in more gates.
Remove flooded fields
Install Sprinkler System
Training of irrigations
We work hard not to waste water and control run off.
Scheduling 3 wk. Rotation particularly in the hottest months June, July, August
Use CIMIS
Improve system distribution efficiency/ uniformity
Install more drip irrigation systems to replace flood irrigation
Utilize more tech.
Pipeline & tail water recovery

Better balance of water application due to older institutions
Install tail water systems
Leveling & water delivery volume
Need to retrofit old systems on a timelier basis.
Nozzle wear is not being addressed soon enough.
Raise the price of communities so we could afford to improve.
Redesign of some of my systems
Too much tail water
Improve our irrigation systems as in pumps.
Some are too old and they don't work properly anymore.
Install permanent systems
Have irrigation districts deliver water in less than 24 hour intervals, and seven days per week.
Need to put some…???
Tensiometer
Upgrade systems
Do it myself instead of using farm workers.
1) Water delivery system. 2) Level land Level, pipe, and tail water systems
We are doing the best we can under the current farm financial conditions
Better systems - emitters, filters, etc.
Install drip systems
Drip system
Irrigation scheduling or update to micro sprinklers
Install tensiometer type devices to know soil water content
Determine application rates and volumes
Soil moisture tests to not over water
More water and dams
Leveling and new pipeline
Timing of irrigations
Land leveling
Install more drip or micro systems.
Drip Irrigation
Education
Adding more drip and sprinkler systems
Add drip to our remaining vineyard.
I could install micro sprinklers on 30 acres-but it is not economically feasible.
More drip-land leveling
New underground distribution and above ground tubing & M.S
Better capturing of information estimating plant demanded better.
More fan jet systems added.
Timing
Improvement of underground piping.
Sprinkler System
Install drip systems
Get labor that is reliable
Better isolation of problem areas.
Land leveling
Scheduling irrigations
Improve DU for systems and replace flood systems with sprinkler (micro)
I would improve the volume of water delivery
Install drip/micro
More drip
Level, better wells, drip
Better filtration system and emitter
Mountains more efficiency use of water.
Leveling/grading the fields in order to control flow
Micro sprinkler/drip
You always learn something new
Up to date and easy access to micro environment
Change to drip
Can always improve
Go to drip
Larger under ground pipes.
Install improved tail water system
Drip on vineyard
Lazer level
Drip
You always think you can improve.
Install remote soil moisture measuring devices with telemetry to central location
Drip/micro
Level ground
More sprinklers- more efficient use of water, but expensive to retrofit.
Change to micro- sprinkler system for orchards
More micro irrigation systems installations
Could switch to micro sprinklers
Putting a dip system on land which is not level or graded. Water would not collect at the low ends.
Don't know how much water I am applying per acre.
Install micro sprinklers

Install and use drip if raisin price allowed for investment
Irrigation timing, when the plants need it.
Change slope of land
Change land grades to simplify
Sprinkler system needs more maintenance
Scheduling
More volume
I think we could do better
Add more drip
1) Irrigate earlier, 2) Fix pipelines or need new ones, 3) Level uneven fields, too much water or not enough water.
Get more uniformity in applications
Better monitoring technology
Install drip
Hire night time irrigators to cut water use.
Check water pressure on all line hoses
Record more data w/field irrigation timing and results
Level land
Drip System
I still use some furrow irrigation-would switch to micro jets, but costly plus have to re pump water to pressure system
We need land leveling and bigger pipe size
Update water system - micro sprinklers
Try to keep pressure more even
Land leveling
If I continue flood irrigation
Redesign entire system with auto controls and instrumentaltation.
Land leveling
Soil infiltration
Lock of water
Switch flood to sprinklers
Would put some of ranches with sandy soil on micro systems, to save water
On furrow irrigation, I could use more surface pipe to create shorter runs.
Level land and install sprinklers
Relevel ground

Question 23

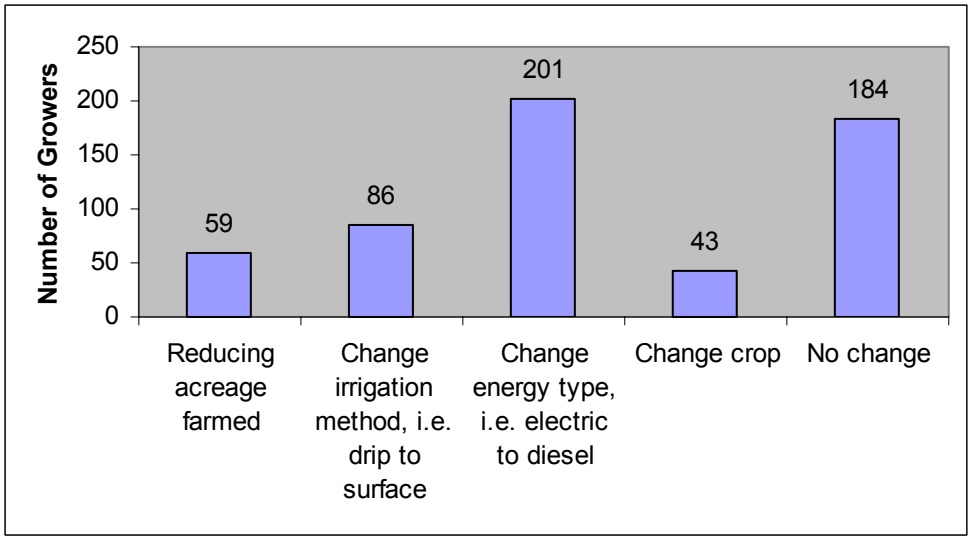
What contingency plans do you have in the event of a prolonged drought? *(Number in order of importance with 1 being the most important. Use N/A for any that do not apply.)*

238 chose "Improve system efficiency" with an average ranking of 2
217 chose "Develop a deficit irrigation plan" with an average ranking of 2
136 chose "Modified cropping plan" with an average ranking of 3
235 chose "Drill new wells" with an average ranking of 3
168 chose "Obtain water from other sources" with an average ranking of 3
160 chose "Take land out of production" with an average ranking of 3
173 chose "Quit farming/out of business" with an average ranking of 4

Question 24

The expected rise in energy costs for pumping water will affect my operation by: *(Check any that apply.)*

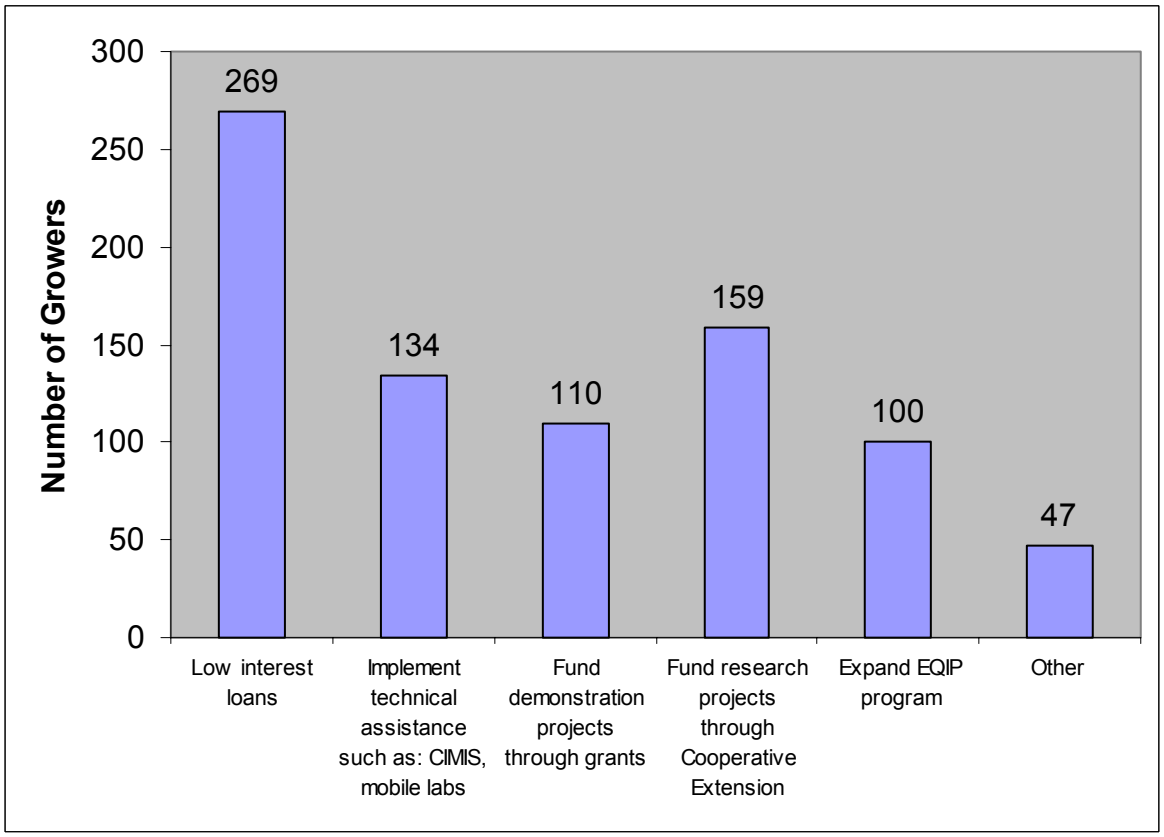
If energy costs were to rise significantly almost half of the growers would change to another type of fuel, but as shown in the graph, almost half would do nothing at all.



Question 25

How can the government assist growers to use more efficient irrigation practices? *(Check any that apply.)*

The largest percentage growers believe government can best assist by providing low interest loans. More than 25% of the respondents believe that funding research programs would be of great help to them.



APPENDIX A

San Joaquin Valley
Grower Irrigation Survey

Grower Assessment Survey

1. Do you primarily farm on the eastside or the westside? *(Check only one)*

   _____ **Eastside** (western slopes of the Sierra Nevada mountains, east of state Hiway 99 along the San Joaquin Valley)

   _____ **Westside** (west of Hiway 99 and east of the coastal foothills along the San Joaquin Valley).

2. How many years have you been farming? _____ years

3. How many acres do you: Own? _____ac Lease? _____ac

4. In an average year what percentage of your water is supplied by groundwater and surface sources?

   Groundwater _____% Surface _____%

   Name of your irrigation district _____

5. What is your current cropping pattern?

   ANNUAL: Forage _____ac Field crops _____ac Vegetable crops _____ac Fallow _____ac

   PERMANENT: Vines _____ac Orchard _____ac Pasture _____ac

6. How many acres do you currently have under the following irrigation systems?

   Flood _____ac Sprinkler _____ac Drip/micro _____ac Other _____ac

7. How many acres did you have under the following irrigation systems 10 years ago? (If applicable.)

   Flood _____ac Sprinkler _____ac Drip/micro _____ac Other _____ac

8. What is the main energy source you use for pumping? *(Check only one.)*

   ☐ Electricity ☐ Diesel ☐ Natural gas ☐ Gravity

9. Do you practice chemigation (injecting chemicals into the irrigation water) with any of the following?

   Fertilizers ☐ Yes ☐ No Pesticides ☐ Yes ☐ No

   Amendments ☐ Yes ☐ No Animal waste ☐ Yes ☐ No

10. If you have a problem applying irrigation water uniformly, what do you feel is the primary cause? *(Check only one.)*

    ☐ System maintenance
    ☐ System design (pipe sizing, land leveling, etc.)
    ☐ Poor water infiltration
    ☐ Lack of proper irrigation scheduling
    ☐ No problem

11. Are you using any flow measuring methods to find out how much water you are applying with each irrigation? *(Check all that apply.)*

- ☐ Water meters
- ☐ Meter gates
- ☐ Irrigation district records
- ☐ Pump test
- ☐ Time (hours per irrigation)
- ☐ No measurement used

12. Do you schedule your irrigations by: *(Check all that apply.)*

- ☐ Calendar
- ☐ District delivery system
- ☐ Internet
- ☐ Soil moisture
- ☐ Irrigation scheduling software
- ☐ Plant observation
- ☐ Other _____

13. Does water quality affect your decision on when to irrigate and how much water to apply?

☐ Yes ☐ *No* *If yes, please describe how.*

_____

_____

_____

_____

_____

14. Have you made use of available financial assistance offered through government agencies for irrigation system improvement or management?

☐ Yes ☐ No *If yes, please check any that apply.*

- ☐ Department of Water Resources
- ☐ Electric Utility Company
- ☐ Farm Service Administration
- ☐ California Energy Commission
- ☐ NRCS/EQIP
- ☐ Other _____

15. If you answered yes to question 14, was financial assistance critical to making these improvements to your irrigation system or management practices?

☐ Yes ☐ No

16. Do you anticipate any immediate improvements to your irrigation systems or water management capabilities? *(Check any that apply.)*

- ☐ Change the way you make irrigation scheduling decisions
- ☐ Retrofit old irrigation systems
- ☐ Install new irrigation systems
- ☐ Do not anticipate any immediate changes
- ☐ Other _____

17. Do you have any special factors that impact your ability to irrigate effectively and profitably, such as: *(Check any that apply.)*

☐ Fixed delivery schedule
☐ Lack of tail water control
☐ Difficult soil conditions
☐ Poor water quality
☐ Insufficient water quantity
☐ Improperly graded fields
☐ System design limitations (pipe size too small, not enough valving)
☐ Other

Describe _____

_____

_____

18. What improvements would you make to your irrigation systems if you had a zero interest or low interest loan? *(Number in order of importance with 1 being the most important. Use N/A for any that do not apply.)*

_____ Improve the water supply
_____ Attend educational and training seminars (for self or employees)
_____ Land leveling
_____ Install drip/micro
_____ Install sprinklers
_____ Hire a water management consultant
_____ Install a mechanical move system
_____ Install a tail water recovery system
_____ Other _____

19. What are your sources of information on irrigation systems and water management? *(Number in order of importance with 1 being the most important. Use N/A for any that do not apply.)*

_____ Irrigation dealer
_____ UC extension/Irrigation Training & Research Center, Cal Poly
_____ Internet
_____ Tradeshows
_____ Irrigation consultants
_____ Neighbors
_____ The Center for Irrigation Technology/CATI
_____ Other _____

20. Is ground or surface water contamination from farming a concern in your area?

☐ Yes ☐ No If yes, what farming practices should be changed? *(Check all that apply.)*

☐ Better designed irrigation systems
☐ Better managed irrigation scheduling
☐ Better management of fertilizer/chemical application
☐ Other _____

21. Are you familiar with the CA Irrigation Management Information System (CIMIS)? ☐ Yes ☐ No

Do you use CIMIS in your water management activities? ☐ Yes ☐ No

22. Do you irrigate as efficiently (considering uniformity and management) as you think you could?

☐ Yes ☐ No If no, what one thing would you do to improve it?

_____

_____

23. What contingency plans do you have in the event of a prolonged drought? *(Number in order of importance with 1 being the most important. Use N/A for any that do not apply.)*

_____ Modified cropping plan
_____ Take land out of production
_____ Develop a deficit irrigation plan
_____ Drill new wells
_____ Obtain water from other sources
_____ Improve system efficiency
_____ Quit farming/out of business
_____ Other _____

24. The expected rise in energy costs for pumping water will affect my operation by: *(Check any that apply.)*

☐ Reducing acreage farmed
☐ Change irrigation method, i.e. drip to surface
☐ Change energy type, i.e. electric to diesel
☐ Change crop
☐ No change

25. How can the government assist growers to use more efficient irrigation practices? *(Check any that apply.)*

☐ Low interest loans
☐ Implement technical assistance such as: CIMIS, mobile labs
☐ Fund demonstration projects through grants
☐ Fund research projects through Cooperative Extension
☐ Expand EQIP program
☐ Other _____

Additional comments _____

_____

_____

_____

_____

THANK YOU FOR TAKING THE TIME TO FILL OUT THIS SURVEY