

Pajaro Valley Covered Fallow Plan Project Update

April 6, 2017
Community Water Dialogue Meeting

Community 
Water Dialogue
of the Pajaro Valley



Intro

- Why a covered fallow plan?
 - Goals: Conserve water and co-benefits for water quality and carbon
- How?



Questions

- How much land in the PV is currently in rotational fallow?
- Can additional water savings (and other benefits) be realized by incentivizing additional, voluntary, rotational fallowing?
- What would it cost?
- How could it be incentivized?
- What is the goal (AF water saved) and how many acres would need to be put into a fallow rotation to meet that goal?

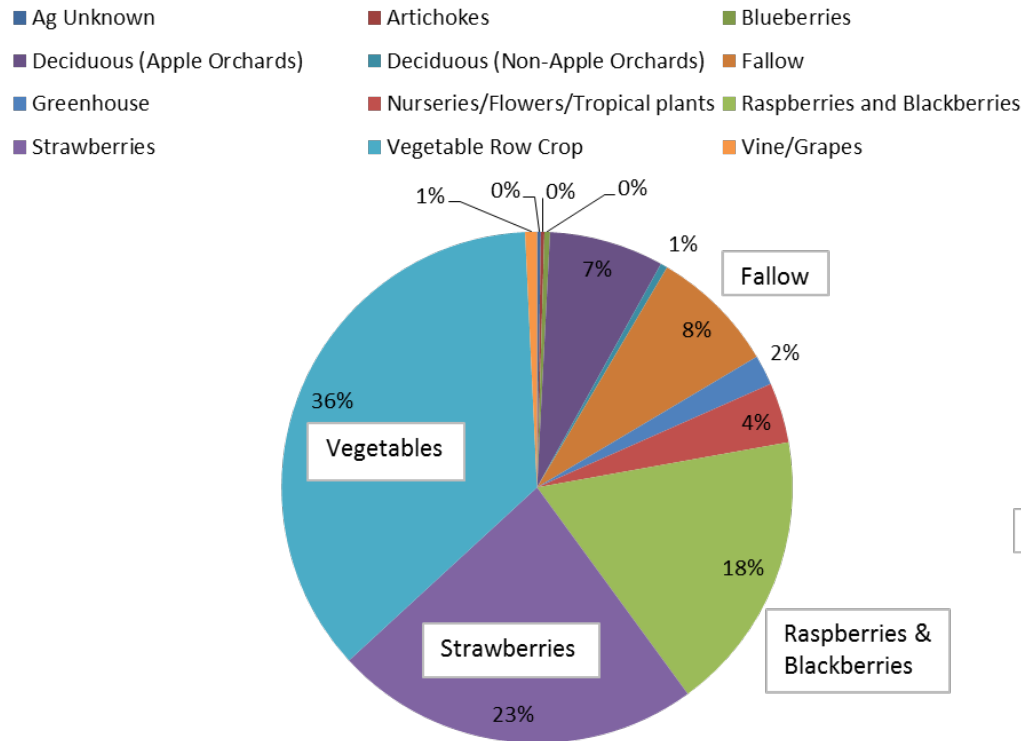
Planning Process

- **PV Water Survey and mapping to evaluate current use of cover cropping and fallowing**
- **Cost benefit analysis**
 - Individual grower interviews
 - Landowner focus group
 - TAC input
 - Follow up focus group (growers, landowners, and TAC members)
 - Existing data
- Community input to set goals
- Explore Potential Incentives and funding mechanisms
- Draft Plan for community feedback
- Finalize Plan (November 2017)

How much land is currently fallowed?

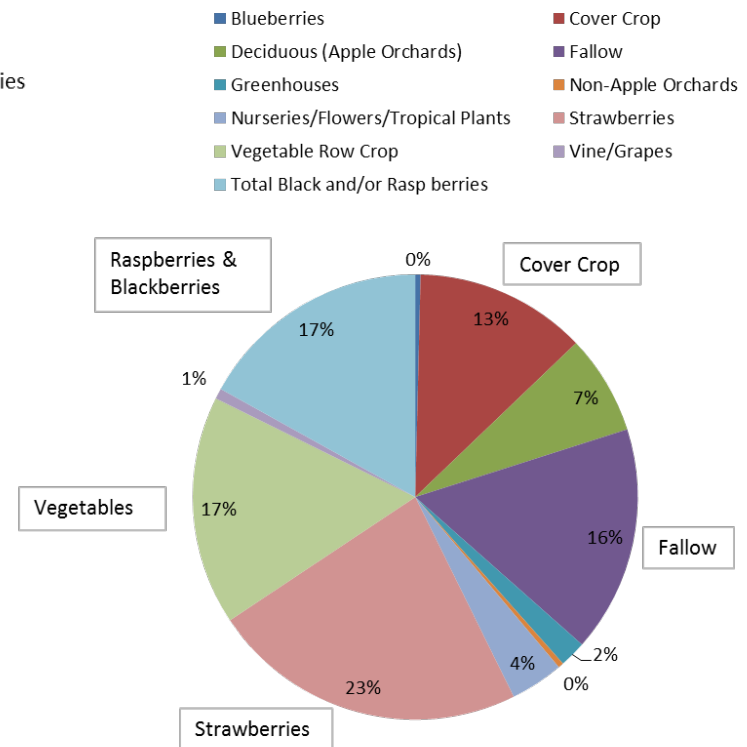


2015 Summer PV Ag Land Use by Crop Type



Summer Fallowed acres:
2,167 (8% total ag acreage)

2016 Winter PV Ag Land Use by Crop Type



Winter Fallowed acres: 7,813 (29% total ag acreage) 43% of the fallowed acreage had cover crop

Community input

- **Fallow with or without cover?**
- **What crops and periods can most feasibly be modified to include covered fallow rotations?**
- **What does it cost?** (rent, labor, lost revenue, etc)
- **Input on benefits** (water conservation, green house gas emissions reduction, yield benefits, etc)
- **Desired incentives**
- **Conservation targets for the plan**

Cover crop scenarios

Scenario	Practice	Cover crop within Fallow Period	Crop Replaced by Cover
1	Conv.	Winter cover (4 month cover within 5 month fallow period)	None (minority of vegetable prod.)
2	Conv.	Spring / summer cover (2 month cover within 3 month fallow)	Spinach or Leaf Lettuce
2a	Organic	Spring / summer cover (2 month cover within 3 month fallow)	Spinach or Leaf Lettuce
3	Conv.	Full year - 8 month cover within 12 month fallow	Broccoli and Leaf Lettuce
3a	Organic	Full year - 8 month cover within 12 month fallow	Broccoli and Leaf Lettuce
4	Conv.	Full year - 8 month cover within 12 month fallow	Strawberry
4a	Organic	Full year - 8 month cover within 12 month fallow	Strawberry

Cost Benefit Analysis

- Costs (UCCE, AMS, NASS, Ag Commissioner Reports, grower input)
 - Foregone revenue
 - Gross returns (yield and price)
 - Operating costs (seeding/transplant, fertility, labor non-harvest, harvest labor and machinery, water, other operating expenses)
 - Cash overhead (Land rent by crop period, Other cash overhead)
 - Non-cash overhead
 - Establishing and maintaining cover crop
 - Seeding/plant material
 - Labor and equipment to plant/mow/disc
 - Water use (0-4 acre inches)

Summary of costs per acre

			Private Costs		
	Cover crop within Fallow Period	Crop Replaced by Cover	Low	Most Likely	High
Scenario 1	Winter cover (4 month cover within 5 month fallow period)	None (minority of vegetable prod.)	\$130	\$240	\$370
Scenario 2	Spring / summer cover (2 month cover within 3 month fallow)	Spinach or Leaf Lettuce	\$500	\$1,220	\$1,900
Scenario 2a	Spring / summer cover (2 month cover within 3 month fallow)	Organic Spinach or Leaf Lettuce	\$3,800	\$4,950	\$6,200
Scenario 3	Full year - 8 month cover within 12 month fallow	Broccoli and Leaf Lettuce	(\$310)	\$1000	\$2,370
Scenario 3a	Full year - 8 month cover within 12 month fallow	Organic Broccoli and Leaf Lettuce	\$3,340	\$5,490	\$7,800
Scenario 4	Full year - 8 month cover within 12 month fallow	Strawberry	(\$2,300)	\$2,680	\$7,800
Scenario 4a	Full year - 8 month cover within 12 month fallow	Organic Strawberry	\$3,400	\$6,935	\$10,500

Cost Benefit Analysis

- Private Benefits

- Yield benefits (long term, uncertain)

- Public Benefits

- Water supply (water conservation and avoided costs of developing additional sources)
- Water quality (reduced nitrogen and sediment loading)
- Climate mitigation (reduced GHG emissions and carbon sequestration)

Most likely benefits

Scenario	Cover crop within Fallow Period	Crop Replaced by Cover	Water Saved (AF)	Nitrogen Avoided (pounds/acre)	Sediment loading avoided (tons/acre)	Carbon emissions avoided plus carbon sequestration (tons/acre)
1	Winter cover (4 month cover within 5 month fallow period)	None (minority of vegetable prod.)	0	0	3.83	-0.04
2	Spring / summer cover (2 month cover within 3 month fallow)	Spinach or Leaf Lettuce	0.86	22	1.92	1.8
2a	Spring / summer cover (2 month cover within 3 month fallow)	Organic Spinach or Leaf Lettuce	1.03	22	1.92	1.8
3	Full year - 8 month cover within 12 month fallow	Broccoli and Leaf Lettuce	2.8	119	7.67	2.7
3a	Full year - 8 month cover within 12 month fallow	Organic Broccoli and Leaf Lettuce	2.97	119	7.67	2.8
4	Full year - 8 month cover within 12 month fallow	Strawberry	2.22	56	7.67	2.8
4a	Full year - 8 month cover within 12 month fallow	Organic Strawberry	2.22	56	7.67	3.8

Water Savings

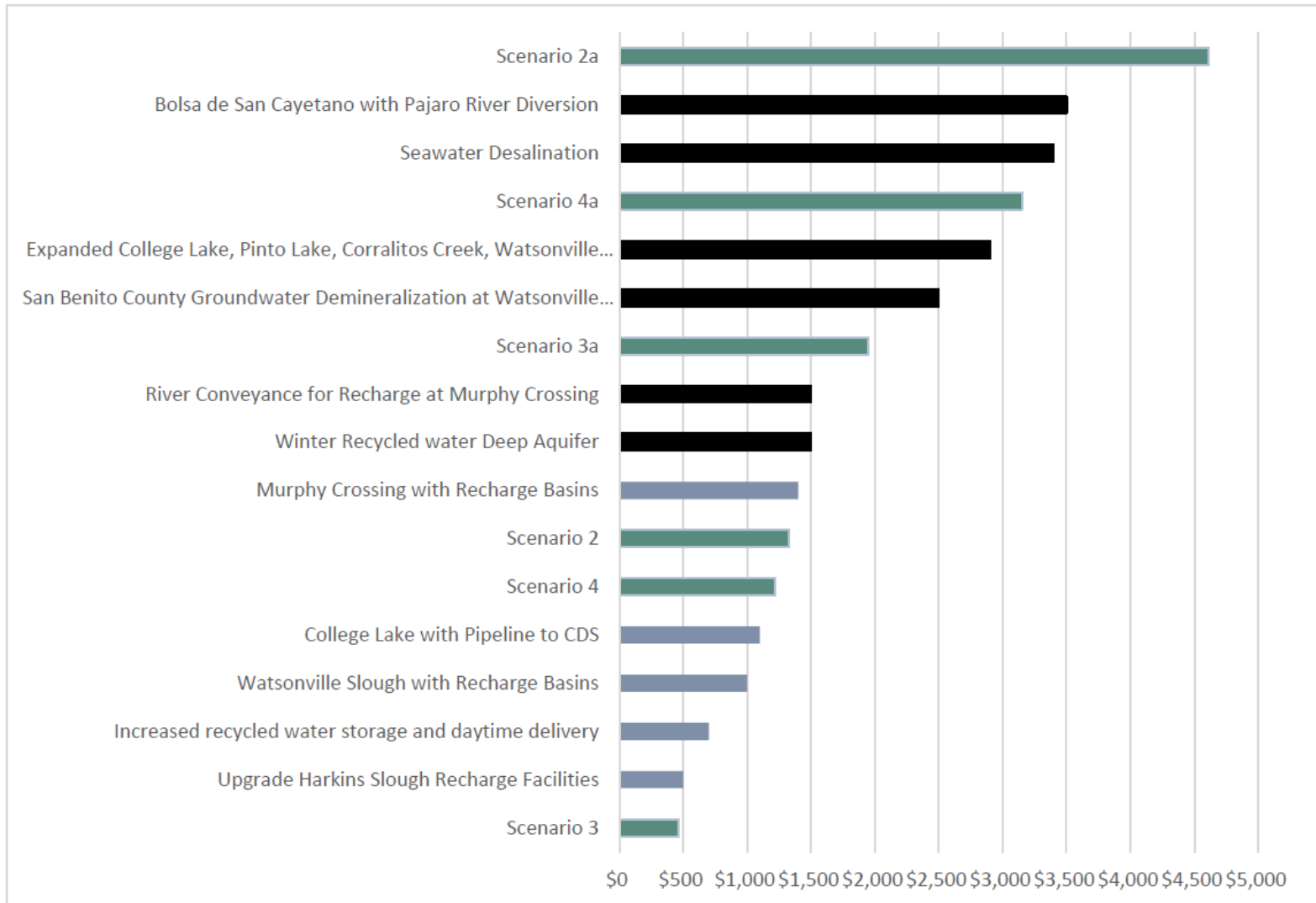
Scenario	Cover crop within Fallow Period	Water Use Cover Crop (acre – inches)*	Crop Replaced by Cover	Water Use Crop Replaced (acre – inches)*	Most likely water saved (acre – inches)
1	Winter cover (4 month cover within 5 month fallow period)	0 – 4 (0)	None (minority of vegetable prod.)	0	0
2	Spring / summer cover (2 month cover within 3 month fallow)	0 – 4 (0.7)	Spinach or Leaf Lettuce	8 – 15 (11)	10.32
2a	Spring / summer cover (2 month cover within 3 month fallow)	0 – 4 (0.7)	Spinach or Leaf Lettuce	8 – 17 (13)	12.36
3	Full year - 8 month cover within 12 month fallow	0 – 8 (1.4)	Broccoli and Leaf Lettuce	35	33.6
3a	Full year - 8 month cover within 12 month fallow	0 – 8 (1.4)	Broccoli and Leaf Lettuce	37	35.64
4	Full year - 8 month cover within 12 month fallow	0 – 8 (1.4)	Strawberry	28	26.64
4a	Full year - 8 month cover within 12 month fallow	0 – 8 (1.4)	Strawberry	28	26.64

Cost Effectiveness

Scenario	Practice	Cover crop within Fallow Period	Crop Replaced by Cover	Costs per acre	Most likely AF water saved	Most likely Cost/AF water conserved
1	Conv.	Winter cover (4 month cover within 5 month fallow period)	None (minority of vegetable prod.)	\$245	-	N/A
2	Conv.	Spring / summer cover (2 month cover within 3 month fallow)	Spinach or Leaf Lettuce	\$1,220	0.86	\$1,325
2a	Organic	Spring / summer cover (2 month cover within 3 month fallow)	Spinach or Leaf Lettuce	\$4,950	1.03	\$4,610
3	Conv.	Full year - 8 month cover within 12 month fallow	Broccoli and Leaf Lettuce	\$1000	2.8	\$465
3a	Organic	Full year - 8 month cover within 12 month fallow	Broccoli and Leaf Lettuce	\$5,490	2.97	\$1950
4	Conv.	Full year - 8 month cover within 12 month fallow	Strawberry	\$2,680	2.2	\$1,220
4a	Organic	Full year - 8 month cover within 12 month fallow	Strawberry	\$6,935	2.2	\$3,150

Cost effectiveness

PVWMA Costs/AF and Cover Crop Fallow Scenarios



Cost Benefit Analysis

	Private Costs			Public Benefits			Estimated probability Benefit>Cost
	Low	Most Likely	High	Low	Most Likely	High	
Scenario 1	\$130	\$240	\$370	\$8	\$17	\$27	0%
Scenario 2	\$500	\$1,220	\$1,900	\$597	\$832	\$1,059	24%
Scenario 2a	\$3,800	\$4,950	\$6,200	\$685	\$952	\$1,221	0%
Scenario 3	(\$310)	\$1,000	\$2,370	\$1,945	\$2,665	\$3,382	86%
Scenario 3a	\$3,430	\$5,490	\$7,800	\$2,025	\$2,791	\$3,550	3%
Scenario 4	(\$2,300)	\$2,680	\$7,800	\$1,448	\$2,021	\$2,580	45%
Scenario 4a	\$3,400	\$6,935	\$10,500	\$1,547	\$2,092	\$2,650	4%

Note: Benefits are likely highly underestimated as this analysis does not factor in private benefits such as potential yield improvements in subsequent crops (estimated at \$60-\$2,320 per acre depending on crop)

Take home messages

- Private costs of cover cropping are driven by the cost of forgoing a market crop rotation
- Winter cover cropping (Scenario 1) does not result in water savings (because typically not replacing irrigated crop), but may have other potential benefits
- All other cover cropping scenarios have costs to the grower that range from an expected \$1,000 to \$6,935 an acre
- Private costs per AF of water savings ranges from \$465 to \$4,610. Most scenarios fall within the cost/AF range of projects considered in BMP
- The scenario with the clearest result that value of water savings exceeds the cost to the grower is Scenario 3 (8 month cover within 12 month fallow replacing broccoli and lettuce)
 - In Scenario 3, private cost per AF of water savings is estimated to average \$465.
- Total public value of rotational cover should be considered in making the case for incentives

Potential Incentives

- Rebate or reduced water bill
- Tax break
- Rent reduction
- **Others?**



Potential Funding Sources

- Local beneficiaries (ex. through augmentation fee or property taxes)
- Carbon credit markets
- Grants



How to structure an incentive

- Identify program goal
- Identify funding source
- Determine payment rate
- Fund disbursement and Monitoring
- Rules to consider
 - Incentivizing fallowing of lands that otherwise would have been irrigated
 - Payment per acre or per unit benefit (ex. per AF water conserved)
 - Eligibility criteria
 - Facilitating broad program participation
 - Biggest bang for the buck
 - Evaluating results

Planning Process Remaining

- Community input on conservation goal
- Decision Support Tool Development
- Explore potential incentives and funding mechanisms
- Draft Plan for community feedback
- Finalize Plan (November 2017)

Questions?

Lisa Lurie

RCDSCC

831-464-2950 x 27

llurie@rcdsantacruz.org

Sacha Lozano

RCDSCC

831-464-2950 x 11

slozano@rcdsantacruz.org