Potential Water Savings through Improved Irrigation Efficiency in Pajaro Valley, California

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ABSTRACT

Water conservation not only provides short-term benefits for the environment, but more importantly, it constitutes a long-term investment for the future. Pajaro Valley, an agricultural region 90 miles south of San Francisco, is actively pursuing new strategies to improve the sustainability of their water resources. Water use efficiency is included in the valley's Basin Management Plan (BMP) Update (Pajaro Valley Water Management Agency, 2013). This project was developed in partnership with the Pajaro Valley Water Management Agency (PVWMA) to evaluate: (1) how much water could be saved through agricultural conservation, and 2) the economic impact on the PVWMA and growers in Pajaro Valley. This project estimates the potential water savings in Pajaro Valley by applying (a) an interview campaign with growers, (b) an evapotranspiration (ET) consultation with experts, and (c) a statistical analysis of the collected data. Through growers' interviews, data was acquired on quantity of water applied to different crops and the amount of money growers invest in crop production. To answer the water conservation savings question, the applied water and crop ET were compared. By conducting grower interviews, the amount of water different growers applied to their various vegetable and berry crops was determined and the behavior of the study site was applied to the entire valley. In summary, Pajaro Valley has the potential to save **4,600** to **5,100** Acre-Feet per year (AF/year) of water through conservation.

Two sets of data from 2009 and 2011 were analyzed to estimate the average applied water volume per crop. The analysis focused on 2009 because it was a normal year in terms of precipitation and water usage. Land use data provided by PVWMA for this year contained a large acreage (16%) of unknown agriculture. There is an estimated total water savings of 4,600 AF/year if any potential water savings in the "unknown agriculture" area are disregarded. If this area is considered and the unknown agriculture land is assumed to follow the same distribution of crops as the rest of the valley, then the total potential water savings are estimated as 5,100 AF/year.

Water savings will result in a direct decrease in revenue for PVWMA ranging from $862,000 to $951,000. To compensate for this loss in revenue, an increase in extraction fee rates (referred by PVWMA as an augmentation fee) was considered. This action will affect farmers, especially vegetable crop growers in the coastal zone. Coastal zone growers currently estimate $3,910/acre revenue per growing season. If water rates are increased by 50% ($105/AF), the revenue of vegetable coastal growers will be decreased by 6.9% ($271) per growing season. This strategy will affect farmers, lowering their net profit on crops. Growers of strawberries, raspberries, blackberries and nurseries have a larger return per unit water applied; therefore, increased water fees will not significantly impact these growers.

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