

2019 FREP Concept Proposal

Project Title: **Promoting the adoption of CropManage to optimize nitrogen and irrigation use through low-cost data loggers and cellular modems for Spanish-speaking growers in Santa Cruz and Monterey Counties**

Project Leaders:

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Location: Santa Cruz and Monterey Counties

Duration: One year

1. Problem Summary

CropManage is an online decision-support tool developed by the UC Cooperative Extension (<https://v3.cropmanage.ucanr.edu/>) that assists growers with water and nitrogen management. The adoption of CropManage as a management practice has great potential for improving water and nitrogen efficient management, particularly in vegetable and berry production, by reducing over-irrigation and thus leaching of nitrogen to the groundwater. However, barriers to the adoption of this tool have been the high cost of equipment (flowmeters and data loggers) needed to collect irrigation data in the field and to upload them to CropManage enabling the software to produce recommendations. A 3" flowmeter, typically needed in the Central Coast production systems, costs less than \$1000, but a Campbell Scientific research-grade station including data logger, modem, battery, enclosure, etc. costs more than \$3000. Additionally, substantial technical knowledge is needed to assemble, wire and program a Campbell Scientific datalogger-modem station. The high costs and complexity of this equipment constitutes the real barrier to widespread adoption of CropManage from growers in the area. The RCD of Santa Cruz County, in collaboration with interns from UC Santa Cruz Baskin School of Engineering, recently developed a low-cost (<\$300) data logger with cellular modem communication that mimics the output from Campbell Scientific data loggers and produces the same file format automatically uploadable into CropManage.

2. Target audience

The project will assist berry and vegetable growers, field managers and irrigators, including Spanish-only speakers in Santa Cruz and Monterey counties.

3. Objective

The project's objective is to enable growers to access water and nitrogen management recommendations on CropManage. The adoption of automatic irrigation water tracking by data loggers and automatic upload into CropManage is an improvement that makes this existing decision support tool more practical for vegetable growers in the Central Coast. Promoting the adoption of this tool will result in better irrigation management and improved nutrient-use efficiency.

4. Approach

The project will be a field-scale demonstration of water and nitrogen application practices recommended by CropManage with the use of low-cost pre-programmed data logger-modem units. Flowmeter and data logger units will be installed at the fields of participating growers as part of a loaner program to allow growers to test the technology. Growers and irrigators will be trained on how to install flowmeters and dataloggers in the irrigation system and assistance will be provided in the field to monitor the equipment. Additionally, technical education will be offered on how to setup an account, ranch and planting on CropManage to give growers and irrigators access to recommendations through computers and mobile devices. The participating growers will be visited bi-weekly and CropManage recommendations compared to current water management will be reported to growers and irrigators. Potential savings in water and in monetary terms will also be reported to growers during visits and at the end of the crop cycle.

5. Outreach and measurable outcomes

An on-farm workshop will be organized at a participating ranch to share the grower's experience with other interested growers in order to encourage peer-to-peer learning. An excellent occasion for participating irrigators to present their experience is the annual PVWMA irrigator meeting held every year in March in Watsonville. The projects success will be measured with the number of ranches that adopt CropManage thanks to the use of the low-cost data logger units.

6. Funding

For this project, the funding requested from FREP is 50,000 for one year, with a possibility of leveraging on other funding sources such as UCANR, PVWMA and NRCS.