

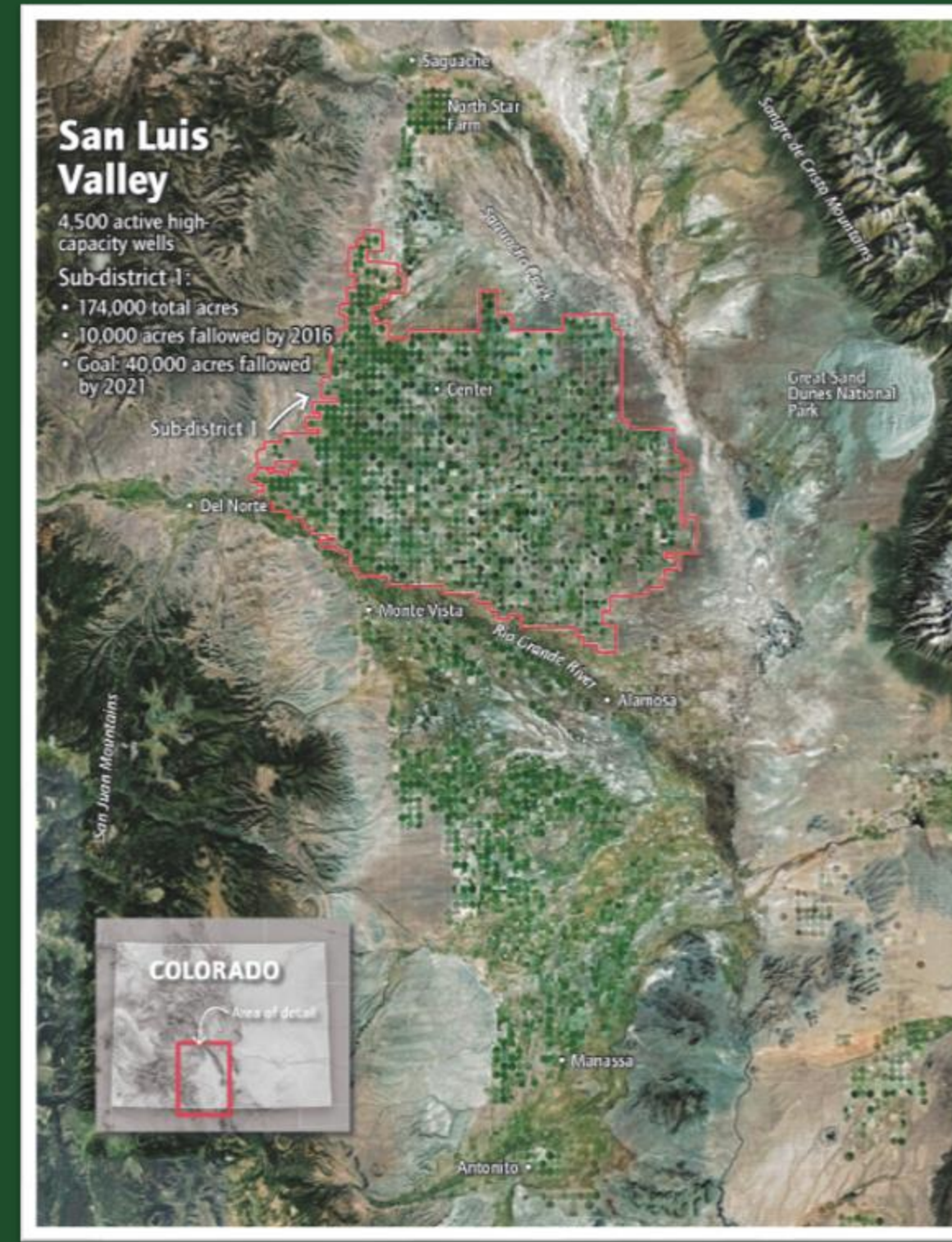


What alternative crops can be grown with very low water use and marketed profitably in the San Luis Valley Southern Region

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Project

The San Luis Valley in southern Colorado is responsible for producing 25% of the fresh market potatoes in the US. The region receives an average of 7-9 inches of annual precipitation, and its agricultural economy relies on center pivot irrigation using aquifer water. However, due to prolonged drought and excessive pumping, many farmers are experiencing water shortages. Introducing alternative crops that require less irrigation alongside potatoes can help conserve water resources and offer an additional source of income for farmers.



(Pic 1. San Luis Valley on the map)

In the first two years of this study, we assessed various species for their water efficiency and yield. Proso millet and several varieties of dry beans were identified as water efficient, high-yielding crops. The goal of this internship was to identify the availability of supply chain, market potential, and enterprise budgets for proso millet and dry beans.

To create an accurate enterprise budget, we conducted a series of interviews with local and state-wide millet and dry bean producers to identify inputs and associated production costs. These values were averaged with local budgets developed by CSU Extension for comparable crops such as legumes and barley. Given the Rio Grande Water Conservation District pumping fees associated with consumptive groundwater use, it is difficult for San Luis Valley millet to turn a profit. Limitations for both millet and dry beans include regional processing and value chain integration opportunities.



(Pic 2. Me planting three varieties of millets)

Millets

- Huntsman
- DL40
- DL240

Beans

- Pinto
- Anasazi
- Bolita

Dry Beans



(Pic 3. Varieties of beans)

There are currently 6 dry bean growers in the valley. Most conventional processing occurs in NE Colorado, and transportation costs jeopardize regional competitiveness. On October 28, SLV Extension will hold a regional enterprise budget workshop to assess the profitability of dry bean production in the valley. Conventional markets are mainly international. With local processing, SLV dry beans are well positioned for export to Mexico, for instance, 719 Produce. Niche markets include farm-to-school initiatives like Nourish Colorado, which use regional, small-scale processing (e.g. Fuel and Iron) and distribution, such as Valley Roots Food Hub.

Millets



(Pic 4. Varieties of millets)

Through a series of interviews with regional and national stakeholders, we have identified both traditional and specialized opportunities in the supply chain and market for millet. Millet's traditional markets are primarily for bird seed, with limited facilities for human consumption due to the requirement for dehulling. However, there is potential for millet in niche markets such as gluten-free beer (e.g. Grouse Brewing) and premium pet food (e.g. Blue Buffalo), where fermentation can replace dehulling. Dry Land Genetics, a company specializing in breeding drought-tolerant, high-yielding millet, has indicated that legislative changes may lead to increased demand for millet in alternative aviation fuels markets.

Enterprise Budgets

REVENUES		YIELD		PRICE		REVENUES	
SOURCE OF REVENUE	PER ACRE	UNITS	PER UNIT	PER ACRE	PER ACRE	PER ACRE	PER ACRE
Proso Millet	14.0	cwt	\$11.00	11.00	154		
TOTAL REVENUES				\$11.00	\$154		
EXPENSES				PER UNIT		PER ACRE	
Operating (pre-harvest) Expenses							
Establishment Charges for Non-Annual Crops				0.00		0	
Land Preparation				1.93		27	
Seed/ Transplants & Planting				5.32		75	
Fertilizer & Application				7.86		110	
Herbicide & Application				1.64		23	
Insecticide & Application				0.00		0	
Mechanized Weed Control				0.00		0	
Irrigation (primarily subdistricts 1)				24.54		344	
Labor, Including Irrigation Labor				0.00		0	
Crop Consulting				0.36		5	
Crop Insurance				2.26		32	
Interest on Operating Expenses (7.5%)				1.65		23	
Total Pre-Harvest Expenses				45.55		638	
Harvest Expenses							
Custom Harvest				1.07		15	
Hauling				0.64		9	
Storage				1.93		27	
Total Harvest Expenses				3.64		51	
TOTAL OPERATING EXPENSES				49.19		689	
Factor Payments							
Cash Rent				0.00		0	
Management Charge				0.00		0	
Overhead/Depreciation/RE Taxes/Other Fixed Costs				0.00		0	
Total Factor Payments				0.00		0	
TOTAL COSTS				49.19		689	
RETURN TO LAND MANAGEMENT & RISK				(38.19)		(\$34.67)	

Table 1. Scenario A: Conventional Market and Production, No Surface Water Rights (Paying to Pump)

*The low application of herbicides and insecticides is due to the biological characteristics of millet.

*Currently Subdistrict 1 pumping fees are set at \$150/acre-foot and anticipated to increase to \$500/acre-foot by 2027

*At current market conditions millet in SLV will not cover its direct cost much less any factor payments

Sensitivity Analysis		25% Lower	10% Lower	Actual Price	10% Higher	25% Higher
%	cwt	\$8.25	\$9.90	\$11.00	\$12.10	\$13.75
25% Lower	10.50	(\$602)	(\$585)	(\$573)	(\$562)	(\$544)
10% Lower	12.60	(\$585)	(\$564)	(\$550)	(\$536)	(\$515)
Actual Yield	14	(\$573)	(\$550)	(\$535)	(\$519)	(\$496)
10% Higher	15.40	(\$562)	(\$536)	(\$519)	(\$502)	(\$477)
25% Higher	17.50	(\$544)	(\$515)	(\$496)	(\$477)	(\$448)

(Table 2. Scenario B: Niche Market, Organic Production, Partial Surface Water Rights)

Sensitivity Analysis		25% Lower	10% Lower	Actual Price	10% Higher	25% Higher
%	cwt	\$16.50	\$19.80	\$22.00	\$24.20	\$27.50
25% Lower	10.50	(\$274)	(\$239)	(\$216)	(\$193)	(\$158)
10% Lower	12.60	(\$239)	(\$197)	(\$170)	(\$142)	(\$100)
Actual Yield	14	(\$216)	(\$170)	(\$139)	(\$108)	(\$62)
10% Higher	15.40	(\$193)	(\$142)	(\$108)	(\$74)	(\$23)
25% Higher	17.50	(\$158)	(\$100)	(\$62)	(\$23)	\$34

According to our findings producing millet as an alternative crop seems unfeasible with current prices for transportation and groundwater pumping.

Next Steps

- Share the findings and buyers with a potential growers.
- Explore more opportunities, grants and market for growers in the San Luis Valley.
- Connect with a local government for pushing forward the given project with grants and subsidies.