



SCENARIO 2 (THREE MONTHS) – SPINACH OR LETTUCE

This scenario considers planting a cover crop and maintaining it over a two-month period in the spring or summer before terminating it and prepping the ground for the next commercial crop. The total lost opportunity of commercial production is represented by spinach or lettuce production over a three-month period.

FOREGONE REVENUE ASSUMPTIONS

The primary cost to the grower of cover cropping is the foregone revenue from spinach or lettuce, as shown in the table below.

Per-Acre Net Returns of Crops Foregone – Scenario 2

	<u>Spinach</u>	<u>Leaf Lettuce</u>
Yield	7,280- 8,320 lbs	600 - 900 cartons
Price	\$0.66 - \$1.10 / lb	\$12.15 - \$17.14 / carton
Gross Returns	\$6,500 - \$8,200	\$9,960 - \$12,990
Seeding	\$1,000	\$265
Fertility	\$600	\$387
Labor (non-harvest, \$16.10 / hr)	\$450	\$588
Harvest	\$1,500 - \$1,600	\$5,200 - \$6,400
Water (Spin: 8 ac-in, Let: 15 ac-in)	\$158	\$305
Other Operating Costs	\$780	\$1,776
Total Operating Costs	\$4,480 - \$4,600	\$8,200 - \$9,400
Land Rent by Crop Period	\$1,000 - \$1,700	\$1,000 - \$1,700
Other Cash Overhead	\$144	\$435
Total Cash Overhead	\$1,200 - \$1,600	\$1,400 - \$2,100
Non-Cash Overhead	\$218	\$324
Total Costs	\$5,980 - \$6,340	\$10,200 - \$11,400
Net Returns by Crop	\$400 - \$2,000	\$(400) - \$1,700
Total Annual Foregone Revenue	\$300 - \$1,600	

Based on these cost and return estimates, in planting a cover crop instead of spinach or lettuce commercial crops, **growers would most likely be foregoing \$975 per acre** with a potential range (80 percent chance) of foregoing \$300 and \$1,600 during the three month period. The range aims to represent the diversity of net returns experienced by growers in the Pajaro Valley, while the most likely value is the estimated most common value experienced across the valley.

COVER CROP COSTS

Another private cost that growers would face in following this scenario would be costs to establish, maintain and incorporate in the cover crop during the three-month period in the spring or summer. These activities would most likely cost \$245 per acre with a potential range (80 percent chance) of between \$130 and \$375 per acre.

TOTAL COSTS TO GROWER

Combining the cover crop cost with the foregone revenue costs, total costs to the grower are most likely \$1,220 with the range between \$500 and \$1,900 per acre over the three-month period. Note that the most likely value is approximately the sum of the most likely cover crop cost and the most likely foregone revenue cost, but that the range is not the sum of the lowest and highest values, as it is unlikely that any individual grower in a given year would experience together the lowest (or highest) foregone revenue *and* the lowest (or highest) cover cropping costs.

POTENTIAL YIELD IMPROVEMENTS – PRIVATE BENEFITS

Literature suggests that cover cropping can influence the yields of subsequent crops by affecting: pest and disease pressure, short-



term nitrogen availability (especially for nitrogen fixing crops), long term soil texture and fertility (especially for crops with high carbon-nitrogen ratios), soil loss, and other factors. Studies suggest that the potential short-term adverse yield impact of cover cropping may be up to a 19 percent yield reduction, from cover crops with a high carbon-nitrogen ratio taking an extended period of time to break down in the soil. Literature also suggests the longer term impact of cover cropping is a yield increase, potentially up to nearly 90 percent (Burket, 1997) (Ngouajio, 2003). However, there is uncertainty what the specific yield benefits would be in the Pajaro Valley under current management practices. As such, we cap the positive impact of cover cropping at the maximum yields that UCCE publications suggest are attainable (high-end of their yield sensitivity tables). This is up to a 10 percent increase for spinach and 35 percent increase for lettuce. The financial model suggests the net impact of these increased yields would most likely be \$58 per acre that could partially offset the costs to the grower.

WATER SAVINGS & RELATIVE COSTS PER UNIT

Water use for the crops, based on UCCE publications (Tourte L. a., 2015) (Smith, 2009), as well as discussions with growers (Dennis Lebow, 2016) and PVWMA, is estimated at between eight and 15 inches. While the cover crop is not expected to use water in the most likely situation for this scenario, it is modeled to use up to four inches. In total, this scenario would likely save 10 inches of water, or 0.8 acre feet. Based on the total costs presented above, this scenario would be equivalent to a **most likely water value savings of \$1,325 per acre-foot**, with a range of \$540 to \$2,040 per acre-foot. The short term duration of this scenario relative to Scenario 4 and 5 comes with additional risks that growers would have cover

cropped or fallowed anyway, and thus, the additional benefit of this program could possibly be compromised.

SUMMARY PER ACRE COSTS AND BENEFITS

Value Type	Foregone Crop Revenue	Cover Crop Cost	Total Cost	Water Savings (AF)	Value per AF
Range (80% Chance)	\$300 - \$1,600	\$130 - \$375	\$500 - \$1,900	0.7 – 0.8	\$540 - \$2,040
Most Likely	\$975	\$245	\$1,220	0.8	\$1,325

REFERENCES

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