



SCENARIO 3A (ONE YEAR): ORG. BROCCOLI & LETTUCE

This scenario considers planting a cover crop and maintaining it over an eight-month period before terminating it and prepping the ground for the next commercial crop. The total lost opportunity of certified organic (COG) commercial production is represented by a rotation including broccoli and leaf lettuce over a one-year period. The distinction between this scenario and Scenario 4 is the COG certification.

FOREGONE CROP REVENUE

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

Per-Acre Net Returns Over One-Year Period – Scenario 3a

	COG Broccoli	COG Leaf Lettuce
Yield	542 - 692 boxes	700 - 740 boxes
Price	\$9.90 - \$18.80 / box	\$11.50 - \$18.70 / box
Gross Returns	\$10,300 - \$12,800	\$12,000 - \$16,400
Seeding / Transplant	\$550	\$165
Fertility	\$800	\$855
Labor (non-harvest, \$16.10 / hr)	\$580	\$871
Harvest (labor & mat.)	\$5,000 - \$5,860	\$5,150 - \$5,640
Water (broc: 20 ac-in, let: 17 ac-in)	\$435	\$370
Other Operating Costs	\$320	\$740
Total Operating Costs	7,900- \$8,800	\$8,140 - \$8,660
Land Rent by Crop Period	\$1,000 - \$1,700	\$1,000 - \$1,700
Other Cash Overhead	\$320	\$500
Total Cash Overhead	\$1,400 - \$1,750	\$1,600 - \$1,930
Non-Cash Overhead	\$110	\$130
Total Costs	\$9,600 - \$10,600	\$9,970 - \$10,600
Net Returns by Crop	\$830 - \$2,640	\$1,960 - \$5,830
Total Annual Foregone Revenue	\$3,430 - \$7,800	

Based on these cost and return estimates, in planting a cover crop instead of broccoli and lettuce commercial crops, **growers would most likely be foregoing \$5,490 per acre** with a potential range (80 percent chance) of foregoing between \$3,430 and \$7,800 during the one-year period for both crops. 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

Growers would also incur costs to establish, maintain and incorporate the cover crop during the eight-month period. Growers could either establish one cover crop and let it go to seed, or incorporate the first cover crop before it goes to seed and establish a second cover crop. These activities would most likely cost \$300 per acre with a potential range (80 percent chance) of between \$166 and \$465 per acre.

TOTAL COSTS TO GROWER

Combining the cover crop cost with the foregone revenue costs, total costs to the grower are most likely \$5,800 with the range between \$3,730 and \$8,100 per acre per year. 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 BENEFITS TO GROWER

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



short-term nitrogen availability (especially for nitrogen-fixing cover 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 30 percent yield increase for COG broccoli, and up to a 50 percent increase in yield for lettuce. This suggests that the long-term impact of cover cropping may be an increase of approximately \$3,300 in profit per acre per year that could partially offset the costs to the grower.

WATER SAVINGS & COSTS PER ACRE-FOOT

Water use for the crops, based on UCCE publications (Tourte, 2004) (Tourte, Sample Costs to Produce Organic Leaf Lettuce, 2009), as well as discussions with growers (Dennis Lebow, 2016) and PVWMA, is estimated at 20 inches for broccoli and 17 inches for leaf lettuce, for a total of 37 acre-inches for the year. 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 eight inches maximum. In total, this scenario is likely save 35.6 acre-inches of water, or 3.0 acre-feet. Based on the total costs presented above, this scenario would be equivalent to a **most likely water value savings of \$1,950 per acre-foot**, with a range of \$1,240 to \$2,730 per acre-foot.

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)	\$3,430 - \$7,800	\$166 - \$465	\$3,730 - \$8,100	2.7 – 3.1	\$1,240 - \$2,730
Most Likely	\$5,490	\$300	\$5,800	3.0	\$1,950

KEY REFERENCES

- Burket, J. Z. (1997). Winter Cover Crops and Nitrogen Management in Sweet Corn and Broccoli Rotations. *HortScience* 32, no. 4 , 664-668.
- Dennis Lebow, Dick Peixoto, Mara Miller, Jason Morgan, Arturo Diaz, Paul Faurot, and Dean Sakae (2016, April). Farm Managers in Pajaro Valley. (T. Greenwalt, Interviewer)
- Ngouajio, M. M. (2003). Effect of Cover Crop and Mangement System on Weed Populations in Lettuce. *Crop Protection*, 57-64.
- Tourte, L. R. (2004). *Sample Costs to Produce Organic Broccoli*. University of California Cooperative Extension.
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