



SCENARIO 4 (FULL YEAR) – STRAWBERRIES

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 commercial production is represented by strawberry production over a one-year period.

FOREGONE REVENUE ASSUMPTIONS

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

Per-Acre Net Returns of Foregone Crops – Scenario 4

	<u>Strawberry</u>
Yield	7,890 - 8,550 trays
Price	\$8.50 - \$10.88 / tray
Gross Returns	\$58,800 - \$69,400
Seeding / Transplant	\$2,610
Fertility	\$700
Labor (non-harvest, \$16.10 / hr)	\$21,100
Harvest (labor & mat.)	\$21,900 - \$23,700
Water (acin: 28)	\$780
Other Operating Costs	\$7,500
Total Operating Costs	\$54,500 - \$56,500
Land Rent	\$1,600 - \$4,200
Other Cash Overhead	\$2,670
Total Cash Overhead	\$4,970 - \$6,290
Non-Cash Overhead	\$570
Total Costs	\$60,550 - \$62,800
Net Returns by Crop	(\$2,500) - \$7,600
Total Annual Foregone Revenue	(\$2,500) - \$7,600

Based on these cost and return estimates, in planting a cover crop instead of a commercial strawberry crop, **growers would most likely be foregoing \$2,400** per acre with a potential range (80 percent chance) of foregoing between \$(2,500) and \$7,550 per acre over the year. While the model indicates possible loss of income from operations, this is expected to occur infrequently; with positive net returns likely over a one-year period.

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 \$2,680 with the range between \$(2,300) and \$7,800 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 IMPROVEMENTS – PRIVATE BENEFITS

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) (Seigies, 2006). 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 a 12 percent yield increase for strawberries, resulting in an increase of approximately \$340 per acre per year that could partially offset the costs to the grower.

WATER SAVINGS & RELATIVE COSTS PER UNIT

Water use for the organic strawberry crop, based on UCCE publication (Bolda, 2010), as well as discussions with growers (Lebow, 2016) and PVWMA, is estimated at 28 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 eight inches at most. In total, this scenario would likely save 26.5 acre-inches of water per acre, or 2.2 acre feet. Based on the total costs presented above, this scenario would be equivalent to a **most likely water value savings of \$1,220 per acre-foot**, with a range of \$(1,000) to \$3,400 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)	\$(2,500) - \$7,600	\$166 - \$465	\$(2,300) - \$7,800	2.0 – 2.3	\$(1,000) - \$3,400
Most Likely	\$2,400	\$300	\$2,680	2.2	\$1,220

REFERENCES

- Bolda, M. a. (2010). *Sample Costs to Produce Strawberries*. University of California Cooperative Extension.
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- Dennis Lebow, Dick Peixoto, Mara Miller, Jason Morgan, Arturo Diaz, Paul Furot, 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.
- Seigies, A. T. (2006). Cover Crop Rotations alter soil microbiology and reduce replant disorders in strawberry. *Hort Science*.