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## **ECONOMIC FEASIBILITY OF A SMALL ACREAGE ORGANIC VEGETABLE FARM IN SOUTH TEXAS**



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The model farm, hereinafter referred to as the farm, was developed using a panel of three local small acreage organic vegetable producers in the Lower Rio Grande Valley (LRGV). The study examines the 2011 revenue stream on a three-acre produce operation that relies on three income streams: a Community Supported Agriculture (CSA) Program, farmers markets, and sales to local restaurant establishments. The farm produces about 30 to 50 different vegetable crops on an 11-month growing season, August to June. Under normal growing conditions, each acre of vegetables can supply about 40 to 50 CSA members. The majority of production (80 percent) is used to supply the CSA, with farmers market and restaurant sales each requiring 10 percent of production. The farm is not certified organic, but follows strict organic production practices.

The farm's CSA fee is \$15/week for 24 weeks. Members pay a \$50 membership fee at the beginning of the season for the opportunity to share in the CSA's bounty for the duration of the season. The membership fee is waived for individuals wishing to pay in full for the entire season. CSA members are entitled to weekly delivery of 6-8 items delivered to a pre-determined drop location throughout the growing season. Items are standardized for various forms of produce and examples may include one pound of carrots, one head of lettuce or cabbage, or a pound of greens. The variety of produce included is one of the most positive attributes of the CSA; typically two-thirds of the items are staple foods commonly used in meal preparation, and the other third is more exotic in nature, allowing the member to expand the horizons of their diet. The farm's current production is assumed to support an average of 100 CSA members, and an estimated 10 percent of members pay in full at the beginning of the season. Based on average income levels, the farm's gross receipts from the CSA are estimated at \$40,500.

On average, the CSA generates 63.6 percent of the farm's total cash receipts. In addition to produce distributed



Rey Anzaldúa, owner of Anzaldúa Farm and Ranch, selling at a Lower Rio Grande Valley Farmer's Market.





Example of CSA strawberry cultivation.



Example of CSA-grown produce.

**Table 1. Costs of Production for the LRGV Model Farm, 2011.**

|                         | Unit       | Units | \$/Unit | Fraction | Total Cost      |
|-------------------------|------------|-------|---------|----------|-----------------|
| <b>Production Costs</b> |            |       |         |          |                 |
| Labor                   | Hours      | 1,560 | \$8     | 1.00     | \$12,480        |
| Seed                    | \$/Acre    | 3     | \$150   | 1.00     | \$450           |
| Fertilizer              | Cubic Yard | 84    | \$30    | 0.40     | \$1,008         |
| Fish Oil                | Gallons    | 5     | \$7     | 1.00     | \$37            |
| Neem Oil                | Gallons    | 1     | \$80    | 0.50     | \$40            |
| Emulsifier              | Gallons    | 1     | \$60    | 0.50     | \$30            |
| Diatomaceous Earth      | 50 lb Bags | 3     | \$20    | 1.00     | \$60            |
| Paper                   | Rolls      | 5     | \$190   | 0.50     | \$475           |
| Irr Water               | \$/Acre    | 3     | \$50    | 1.00     | \$150           |
| City Water              | \$/Month   | 3     | \$45    | 1.00     | \$135           |
| Tractor Fuel            | \$/Year    | 1     | \$200   | 1.00     | \$200           |
| <b>Overhead Costs</b>   |            |       |         |          |                 |
| Delivery Containers     | \$/Each    | 200   | \$5     | 0.50     | \$500           |
| Harvest Containers      | \$/Each    | 90    | \$5     | 0.33     | \$150           |
| Wash Water              | \$/Month   | 12    | \$10    | 1.00     | \$120           |
| Summer Electricity      | \$/Month   | 4     | \$200   | 1.00     | \$800           |
| R.O.Y. Electricity      | \$/Month   | 8     | \$50    | 1.00     | \$400           |
| Bags, Bands, Etc.       | \$/Year    | 1     | \$110   | 1.00     | \$110           |
| Delivery Fuel           | \$/Month   | 12    | \$50    | 1.00     | \$600           |
| Maintenance             | \$/Year    | 1     | \$500   | 1.00     | \$500           |
| Internet Service        | \$/Month   | 12    | \$69    | 1.00     | \$828           |
| Marketing               | \$/Year    | 1     | \$490   | 1.00     | \$490           |
| Irrigation Equipment    | \$/Year    | 1     | \$500   | 1.00     | \$500           |
| <b>Total Costs</b>      |            |       |         |          | <b>\$20,063</b> |

through the CSA arrangement, sufficient quantities are available to supply farmers markets and restaurants. Based on 2011 levels, sales to farmers markets in Harlingen and McAllen, Texas accounted for sales of \$18,021 (28.3 percent of total cash receipts). Income is higher from January to June because leafy greens are a favorite among farmers market patrons; no leafy greens are produced from August to December due to unfavorable growing conditions, thus farmers market sales are lower in those months. Restaurant sales to local establishments account for \$5,185 per year in receipts for the farm.

Production and overhead costs for the entire operation were collected during a thorough interview with the farm's producer panel. These values were developed into a budget, reflecting the farm's total costs of production shown in Table 1. Actual costs of production were utilized in 2011 and were estimated at \$20,063. Labor cost accounts for about 62.2 percent of the total cost of production as two part-time workers are needed to help mainly on the production side of the farm. Not included in the cost of production is the labor provided by the owner which is assumed to work full time.

Costs reflected in the financial statements include principal and interest payments for land and machinery. It is assumed that the farm was purchased in 2005 and took out a 10-year loan for \$43,636 at a fixed interest rate of 8.0 percent. An amortization schedule was developed and principal and interest payments are charged to the farm until the loan is paid off in 2014. Similarly, a 5-year machinery loan for \$28,000 was obtained in 2008 for a 74 HP John Deere tractor and included implements. The tractor is depreciated using a straight-line method over an expected 10-year economic life and assumes a \$5,000 salvage value.



**Table 2. Sensitivity Analysis of the Contribution of CSA Members vs. Farmers Markets and Restaurant Sales on Farm's Net Income. Shaded Areas Represent Returns Above Cash Expenses (Green) and Below Cash Expenses (Red).**

| Net Cash Income          |                                      |            |            |            |            |             |             |             |             |             |             |  |
|--------------------------|--------------------------------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
| Reduction in CSA Members | Reduction in FM and Restaurant Sales |            |            |            |            |             |             |             |             |             |             |  |
|                          | 0%                                   | 10%        | 20%        | 30%        | 40%        | 50%         | 60%         | 70%         | 80%         | 90%         | 100%        |  |
| 0%                       | \$ 41,318                            | \$ 38,998  | \$ 36,677  | \$ 34,356  | \$ 32,036  | \$ 29,715   | \$ 27,395   | \$ 25,074   | \$ 22,754   | \$ 20,433   | \$ 18,113   |  |
| 10%                      | \$ 37,268                            | \$ 34,948  | \$ 32,627  | \$ 30,306  | \$ 27,986  | \$ 25,665   | \$ 23,345   | \$ 21,024   | \$ 18,704   | \$ 16,383   | \$ 14,063   |  |
| 20%                      | \$ 33,218                            | \$ 30,898  | \$ 28,577  | \$ 26,256  | \$ 23,936  | \$ 21,615   | \$ 19,295   | \$ 16,974   | \$ 14,654   | \$ 12,333   | \$ 10,013   |  |
| 30%                      | \$ 29,168                            | \$ 26,848  | \$ 24,527  | \$ 22,206  | \$ 19,886  | \$ 17,565   | \$ 15,245   | \$ 12,924   | \$ 10,604   | \$ 8,283    | \$ 5,963    |  |
| 40%                      | \$ 25,118                            | \$ 22,798  | \$ 20,477  | \$ 18,156  | \$ 15,836  | \$ 13,515   | \$ 11,195   | \$ 8,874    | \$ 6,554    | \$ 4,233    | \$ 1,913    |  |
| 50%                      | \$ 21,068                            | \$ 18,748  | \$ 16,427  | \$ 14,106  | \$ 11,786  | \$ 9,465    | \$ 7,145    | \$ 4,824    | \$ 2,504    | \$ 183      | \$ (2,137)  |  |
| 60%                      | \$ 17,018                            | \$ 14,698  | \$ 12,377  | \$ 10,056  | \$ 7,736   | \$ 5,415    | \$ 3,095    | \$ 774      | \$ (1,546)  | \$ (3,867)  | \$ (6,187)  |  |
| 70%                      | \$ 12,968                            | \$ 10,648  | \$ 8,327   | \$ 6,006   | \$ 3,686   | \$ 1,365    | \$ (955)    | \$ (3,276)  | \$ (5,596)  | \$ (7,917)  | \$ (10,237) |  |
| 80%                      | \$ 8,918                             | \$ 6,598   | \$ 4,277   | \$ 1,956   | \$ (364)   | \$ (2,685)  | \$ (5,005)  | \$ (7,326)  | \$ (9,646)  | \$ (11,967) | \$ (14,287) |  |
| 90%                      | \$ 4,868                             | \$ 2,548   | \$ 227     | \$ (2,094) | \$ (4,414) | \$ (6,735)  | \$ (9,055)  | \$ (11,376) | \$ (13,696) | \$ (16,017) | \$ (18,337) |  |
| 100%                     | \$ 818                               | \$ (1,502) | \$ (3,823) | \$ (6,144) | \$ (8,464) | \$ (10,785) | \$ (13,105) | \$ (15,426) | \$ (17,746) | \$ (20,067) | \$ (22,387) |  |



Saul and Diana Padilla, owners of Yahweh's All Natural Farm and Garden, selling at a Lower Rio Grande Valley Farmer's Market.





Example of CSA-grown produce.

The farm experiences positive net cash income in 2011 of \$41,318. Net cash income is defined as total cash receipts minus total cash expenses. This figure does not reflect profit, as principal payments on loans, and employment and income taxes must be paid from this value. The farm experiences a positive annual cash position of \$20,252 in 2011, which includes all the expenses not included in the net cash income such as principal payments on machinery and land loans, and self-employment and income taxes. This analysis does not account for the owner's salary or family living expenses.

Results of a sensitivity analysis examining the contribution of the CSA vs. farmers markets and restaurant sales to the farm's net cash income are reported in Table 2. This sensitivity analysis assumes a constant cash expense. On the vertical axis, reductions on CSA members are shown in increments of 10 percent, while on the horizontal axis reductions on farmers markets/restaurant sales are shown with the same incremental reductions. To illustrate, when both CSA members and farmers markets/restaurant sales present no reduction, the net cash income is \$41,318 as shown previously. However, if there are no CSA members, meaning the only source of revenue is the farmers markets and restaurant sales, the net cash income is only \$820. Conversely, if the only source of revenue were the CSA, then the net cash income would be \$18,113, thus demonstrating the importance of the CSA to the farm's profitability. Moreover, if the number of CSA members is reduced by 40 percent, i.e. 60 members, and the farmers markets/restaurant sales are reduced by 50 percent, then the net cash income would be \$13,515. In order for the farm to remain profitable, it needs to stay within the options highlighted in green.

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