Abstract

The chile pepper has long been a part of the history and culture of the Southwest, and now is an important horticultural crop in New Mexico. Recently the industry has faced many challenges including cheaper imports and rising production costs, which have reduced chile acreage in New Mexico by almost half. To compare production costs in southern New Mexico and northern Mexico, representative cost and return estimates for the two regions were prepared. Even though U.S. producers have higher gross returns, the overall return to land and risk is greater for producers in Chihuahua because of lower production costs (largely due to lower wage rates). This study found advantages and disadvantages for producers on both sides of the border.

Chile Production in New Mexico and Northern Mexico

By Jerry Hawkes, James D. Libbin, and Brandon A. Jones

Introduction

The chile pepper has long been a part of the history and culture of the Southwest. "Chile is synonymous with New Mexico. Washington has its apples, Idaho its potatoes, Florida its oranges. New Mexico loves its chile" (New Mexico Chile Association [NMCA], 2006). Although somewhat of an inside joke, the New Mexico State Question is, "Red or green?" referring to the question always asked by wait staff at restaurants serving Mexican food about which way do you prefer your chile – red or green (NMCA, 2006). Over the last 50 years, chile has become an important horticultural crop in New Mexico. New Mexico's chile industry annually contributes over $400 million to the local economy, and provides 5,000 full-time and over 10,000 part-time jobs. By exporting most of its product, the chile industry brings millions of dollars into the state (NMCA, 2006). Recently the industry has faced many challenges including cheaper imports and rising production costs, which have reduced chile acreage in New Mexico by almost half from 1996 to the present.

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Situation Analysis

To help combat these challenges, the New Mexico Chile Task Force was organized in 1998. When the Chile Task Force was organized at a large industry/university meeting in Las Cruces, participants were asked to speculate on the future of the chile industry in New Mexico. The participants agreed that "given increased pressure from open, global markets with excessively cheap labor, the New Mexico chile industry will not survive another five to seven years without major production cost reductions and/or yield increases" (Diemer 1998). In 2005 David Layton, produce acquisition manager of Border Foods, was approached for the first time by a foreign Peruvian company that wanted to sell New Mexico-type chiles to Border Foods. Layton feared that if he passed on the offer, the Peruvians could become direct competitors by processing the chile themselves (DeWitt, 2005) – a very valid fear, considering that eight years ago producers and processors feared that New Mexico was on the verge of losing its chile industry to foreign competition. Lou Biad confirmed the sentiment saying, "Mechanized harvesting of chile has improved production but we need to move much faster. If not, in five years foreign chile producers will control the whole market" (DeWitt 2005). Due to the low-tech nature of the industry, producers and processors are constantly facing intense international pressure. Although the industry is currently surviving, there are still many problems and challenges, including foreign competition and high production costs.

A Shift in Perspective

A subtle but distinct shift occurred in a relatively short time span over the 1990s. During early Chile Task Force discussions, Mexico was thought of as the greatest threat to U.S. chile production of both red and green chile. However, as green chile processors built new facilities (especially the Border Foods plant in Deming, New Mexico – just 30 miles north of the U.S.-Mexico border in Luna County) and as a fledgling cayenne mash industry took hold, processors began to view northern Mexico as part of the solution rather than part of the problem for the chile market as a whole. Processors first recognized they needed longer production seasons and geographical dispersion to reduce risk (from weather and, more importantly, from disease). They extended contracts to Mexican producers and some bought farm land and/or constructed processing facilities in northern Mexico. Somewhat later and more slowly, U.S. chile producers saw the expanded market and the enhanced financial strength of processors as an advantage for U.S. producers. As a result, the more prevalent view in the industry today is that an integrated production-processing system encompassing five states (southern New Mexico, southeastern Arizona, far west Texas, northern Chihuahua, and northern Sonora) is necessary for the long-term success of each segment and critical for the region to compete with Asia and South America.

General Industry Information and Trends

Globally, 18,827,882 metric tons of chile peppers were produced in the year 2000.[1] The largest producer is China, which produced 8,141,175 metric tons or about 43 percent of the world's chile pepper supply. Other large chile pepper producing countries (see Figure 1) include Mexico, Turkey, Spain, and the United States (FAO-UN, 2000).

A large portion of North America's share of global chile production belongs to New Mexico. Despite recent declines in acreage, New Mexico produces and processes more chile peppers than any other state in the U.S. As of 2004, New Mexico grew 60 percent of the U.S. crop. Texas, Arizona, California, and North Carolina produce much of the rest of the chile crop (Townhall, 2006).

The New Mexico Chile industry is composed of six segments: dry red chile, processed green chile, processed jalapenos, cayenne mash, oleoresin (chile extract), and fresh market red and green chiles (NMCA, 2006). Of the 16,200 acres harvested in New Mexico, 70 percent is in the southern part of the state, namely Doña Ana, Hidalgo, and Luna counties.

With so much of New Mexico's chile being grown and processed in these southern border counties, there is significant interest in what is happening just south across the international border in Mexico. Trends from the 1990s show a rapid increase in imports from Mexico to New Mexico that corresponded with the decrease in chile acreage in New Mexico (Figure 2). Overall chile imports of dried, ground, and crushed red peppers from Mexico have risen from 8,250 metric tons in 1985 to 23,902 metric tons in 2004. Imports of fresh and chilled green chile have risen from 203,970 metric tons to 363,194 metric tons during the same time period (DeWitt 2005).

Much of the chile being grown in Chihuahua and Northern Mexico is processed in Southern New Mexico. The 2006 directory from the Chile Task Force lists 22 processors in the state of New Mexico.[2] These vary from small on farm processing plants to large processors such as Biad and Border Foods that import chile from Arizona, Texas, and Mexico. Many of these processors are located in Doña Ana County (Chile Task Force, 2006), but the source of the chile included several New Mexico counties, neighboring states, and northern Mexico (Figure 3) (Hall & Skaggs, 2003).

Goals and Objectives

Mexican farmers typically plant the same seed varieties and sell the mature pods to the same U.S. processors as their neighboring farmers in Doña Ana and Luna counties. Although Mexican producers can harvest a bit earlier, producers on both sides of the border have become critical to the financial success of processors, especially southern New Mexico green chile processors.

This project originally set out to compare and contrast production costs for green chile in Luna County with those of Chihuahua, Mexico. The objective was to analyze production costs in each of the two regions as well as the overall return to the farmer. This information could then be used to determine if chile production in Mexico is more profitable than in southwestern New Mexico. By using the budgets as a means of comparison, individual components such a labor or fertilizer could be isolated and studied to help understand the differences in production costs and consequently the long-term financial health of producers on both sides of the international border.

Procedures

To compare production costs in southern New Mexico and northern Mexico representative cost and return estimates for the two regions were prepared. For Luna County, a projected cost and return estimate for 2006 developed at New Mexico State University was used as the starting point. No representative cost and return estimate for Chihuahua could be found. Cost information was gathered through personal interviews with ten Mexican chile producers throughout northern Chihuahua. The cost data collected included wage rates, employee benefits, electric rates, taxes, cost of capital, and seed and fertilizer costs. Information on cultural practices used, equipment used, farm size, yields, input costs, harvest costs, and delivery point for harvested products were also obtained. The data were then summarized and using the Luna County budget as a template, a cost and return estimate for the state of Chihuahua was developed. A projected cost and return estimate for Luna County could then be compared to the projected cost and return estimate for the state of Chihuahua to analyze factors accounting for differences in the cost and return structure for each region.

Cost and return estimate information has long been gathered in New Mexico and other states from local producers and state and federal agencies to represent current farming conditions (Libbin & Hawkes, 2007). New Mexico estimates were constructed for an above-average farm management system but do not fit any one particular farm. They provided input for planning and decision making as they take into account equipment used, inputs applied, field operations, labor use, yields, and farm size. In this study these cost and return estimates were used as a means of comparison to analyze differences in production costs and net returns.

Results

Observations and Producer Characteristics

Before introducing the cost and return results, let us describe a few observations that speak to the interconnectedness of the industry more than the numbers do. All ten of the Mexican producers interviewed for these cost and return estimates:

- Spoke English
- Maintained U.S. mailing addresses (most use Post Office boxes)
- Maintained checking accounts in U.S. banks
- Deposited checks written by U.S. processors denominated in dollars into their U.S. bank accounts
- Purchased U.S. inputs with U.S. funds
- Quoted prices in dollars per U.S. unit (such as dollars per ton of green chile or dollars per ton of fertilizer) for virtually all purchased inputs including machinery, fertilizer, chemicals and seed
- Only locally purchased items such as fuel, labor and electricity were quoted in pesos per metric unit (i.e., pesos per liter)
- Many of the producers also had cell phones with a U.S. telephone number.

Interviewees also clearly indicated comfort in conducting business on both sides of the U.S.-Mexico border.

Cost and Return Estimates

Even though Luna County producers have a higher gross return (Table 3), the overall return to land and risk is greater for producers in Chihuahua because of lower production costs. Mexico's advantage of lower production costs is largely due to lower wage rates, since green chile production is such a labor-intensive crop. Comparison of these cost and return estimates showed that many of the purchased inputs were the same for U.S. and Mexican producers, as they should be. Many of the purchased inputs are acquired through U.S. suppliers. Field operations are similar, reflecting the free flow of information from processors, consultant,s and universities across the border. However, the costs of those operations differ because of the labor involved and the cost of thinning. Fixed costs are actually higher in Mexico because of smaller farm size. Luna County farms average 640 acres whereas farms in Chihuahua average 100 hectares (220 acres). Interest expense can be greater for Mexican farmers in comparison to U.S. farmers because of the high cost of capital. Most Mexican farms are self-financed and do not have a cash interest outlay.

The biggest cost difference between the two countries is in the cost of harvest. Generally, green chile is hand harvested and Mexico clearly has the advantage with cheaper labor. Mexican producers currently pay 120 pesos per day ($11 U.S.) for a worker to hand harvest chile for 10 hours per day. In comparison U.S. producers have to pay $5.15 or more per hour. For an eight-hour day that is a direct labor cost of $41.20 for the U.S. producer. In years past, before contracting red chile by red processors and contracting green chile by green processors became the standard, the chiles not picked for the green crop were allowed to mature and ripen. The ripened chile (now turned red) were harvested. But today, the prevalence of specific processors with specific chile varieties, and the high cost of harvest, red chile is usually not harvested after green in Luna County. This is a huge factor in the profitability difference shown in Table 3. Labor costs are actually not quite this simple as U.S. producers incur Social Security and worker compensation taxes and Mexican producers often have to pay for some days that workers don't work. Regardless of the cost issues, producers in both countries view solving labor availability as one of their most critical problems they face, rather than cost. Field day laborers are simply not as available as they were in years past, and regulatory problems seem to be increasing. Red chile producers on both sides of the border are investing in mechanical harvesters while green chile producers see their lack of a reliable green chile harvester as a major issue to international competitiveness.

Advantages in Mexico

1. Labor costs

Labor costs are an extremely important element in all segments of the chile industry. In Luna County, red chile labor costs account for 49.1 percent of total red chile costs, 49.07 percent of jalapeno costs, and 49.1 percent of green chile costs if hand labor is used. However, the labor cost share drops dramatically when using a mechanical harvester, down to 11.6 percent for red chile and 7.8 percent for jalapenos.

Currently within New Mexico, there is a push to raise the minimum wage rate. On January 1, 2007, Arizona's minimum wage rate increased to $6.75/hour. It is inevitable that wage rates will continue to increase, further challenging New Mexico chile producers to find alternatives for hand-harvested chile.

2. Loose Regulations

Although it was assumed in the cost and return estimate for Mexico that all costs were paid, several producers indicated they do not pay electricity bills simply because they don't want to, are protesting something, or feel that the rate is too high. Currently there are no penalties for doing this. The electricity rate they would have to pay is $.045/kwhr whereas in Luna County electricity is $.0867/kwhr.

3. Subsidies

The market price of diesel fuel in Mexico was similar to U.S. price at the time of this study. However, Mexican farmers said that the government allocates them 100 liters of diesel per hectare per year at a subsidized price. The allocated amount of diesel is enough for most producers to work the land in the fall or winter. The subsidized price is about half of the regular price. Any diesel fuel required above the allocated amount is purchased at market price.

The government in Mexico also participates in a 50 percent cost share on irrigation systems including sprinklers, as does the USDA.

Disadvantages in Mexico

1. Cost of Capital

Many of the farmers we interviewed did not use lines of credit and are self-financed, especially the larger farms. However, for those that did it was expensive (approximately 15% versus 8% in Luna County). Because farmers in Mexico have less overhead and smaller operating budgets mainly due to lower labor costs, they don't need or can't obtain financing through a bank. Seed and fertilizer companies do offer credit lines where farmers pay for their seed or fertilizer at the end of the growing season.

2. Land Ownership Issues

It is estimated that 50 percent of the land in Mexico belongs to *ejidos* which makes it difficult to buy and sell land and to increase farm size. An *ejido* is a communal property that is never individually owned but is yours as long as you work it (Barraza 2006). A producer said that Mexican law states that no individual can own more than 100 hectares or 220 acres. One farmer still farmed 1,250 acres; the land ownership was under different names in the family. He felt that the laws were not restrictive in allowing his operation to grow.

3. Border Crossing Issues

Despite NAFTA, Mexican producers are still paying $200 per semi load to cross trucks into the U.S. Each truck is inspected by the U.S. Department of Transportation leading to delays of up to four hours at the border. Transport delays for a fresh product, especially in the middle of a summer, damage product quality and often lead to a decrease in the price that farmers receive.

4. Technology

Although Mexico is progressing, top quality fertilizers and insecticides needed for achieving premier yields are not currently available in Mexico. Some fertilizer and chemical inputs may be purchased in the U.S. but they cannot be crossed at the border. There are many restrictions on allowing theses types of products into Mexico.

Even with these few disadvantages, as indicated by Table 3, net returns to chile producers in Mexico are greater than in the U.S. As yields improve in the U.S. they are also improving in Mexico. Mexican and U.S. producers alike are adopting available technology such as a drip irrigation and the latest fertilizers and insecticides.

Implications

The harvest of chile is labor intensive, as fields are hand picked multiple times. Current mechanical harvesters cannot differentiate between mature and immature pods, therefore green chile needs to be hand harvested. However, producers have had success harvesting jalapenos and red chile with mechanical harvesters. The chile industry must continue to mechanize in order to prepare for rising wage rates in the U.S. and shrinking labor availability, which would make hand harvesting cost prohibitive.

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Endnotes

[1] Virtually all public statistics combine red and green chiles, especially fresh green and fresh red.

[2] Of red and green chile.

Table 1. Chile peppers, value of production for 2005

State Rank	State	Value of production $1,000
1	New Mexico	46,900
2	California	38,942
3	Arizona	18,862
4	Texas	10,199

Source: National Agricultural Statistics Service (NASS)

Table 2. Chile acres harvested by county, New Mexico

County	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chaves	2,500	1,400	2,200	1,700	1,650	1,500	1,400	1,400	1,100	500	1,100	1,300
Dona Ana	8,200	6,000	6,900	7,000	6,300	4,000	4,900	4,200	4,400	3,400	3,900	3,500
Eddy	1,800	1,000	2,000	1,100	800	500	1,100	1,100	1,100			
Hidalgo	2,300	2,200	3,100	2,600	2,500	1,250	2,600	2,200	2,400	2,800	2,700	3,200
Lea	1,200	1,100	1,000	900	800	1,000	700	800	1,100			
Luna	8,000	8,200	9,400	7,600	7,300	6,500	6,500	6,200	5,300	5,000	4,300	4,700
Sierra	2,000	1,000	1,500	900	850	600	700	700	700			
Socorro	400	300	600	350	400	200	300	300	200			
Other Counties	1,500	1,200	2,000	850	900	650	800	800	500	3,000	3,400	3,500
Total	27,900	22,400	28,700	23,000	21,500	16,200	19,000	17,700	16,800	14,700	15,400	16,200

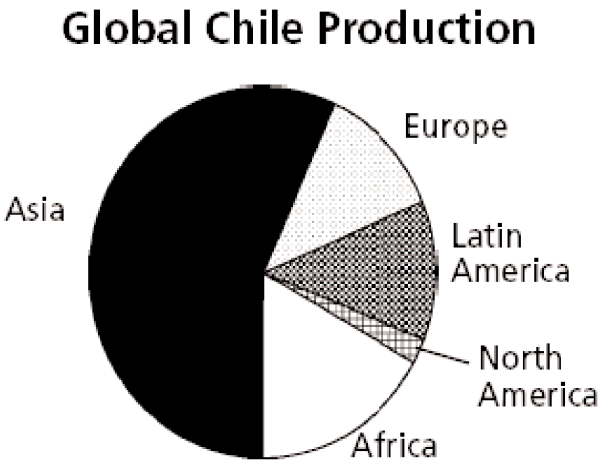
Source: NASS

Table 3. U.S.-Mexico comparison, per-acre cost and return estimates for chile

Comparison Budget		Chihuahua, MEX	Luna, NM
ITEM		TOTAL	TOTAL
GROSS RETURNS			
GREEN CHILE		$2,005.25	$3,900.00
RED CHILE		$1,620.00	$0.00
	TOTAL	$3,625.25	$3,900.00
PURCHASED INPUTS		TOTAL	TOTAL
SEED		$81.00	$72.00
ANHYDROUS AMMONIA (NH3)		$53.81	$78.75
NITROGEN (N)		$33.80	$31.20
PHOSPHATE (P2O5)		$36.00	$60.00
HERBICIDE		$6.25	$15.54
INSECTICIDE		$20.00	$15.54
CROP INSURANCE		$123.00	$72.58
PUMP WATER*			
	SUBTOTAL	$355.86	$345.60
PREHARVEST OPERATIONS		TOTAL	TOTAL
DISC		$10.85	$7.10
PLOW		$36.29	$24.76
DISC		$10.85	$7.10
LASER (CUSTOM)		$10.85	$73.33
LISTER & SPRAY		$11.19	$6.55
FERTILIZE		$3.00	$2.03
PRE-IRRIGATE		$9.82	$19.83
ROLLING CULT		$4.87	$4.29
PLANTER		$14.21	$8.95
CULTIVATOR (5X)		$16.58	$18.56
THIN & HOE (CUSTOM)		$17.00	$90.00
ROTO BUCK (7X)		$13.18	$8.85
IRRIGATE (14X)		$132.17	$251.48
	SUBTOTAL	$290.83	$522.63
HARVEST OPERATIONS			
HARVEST GREEN (CUSTOM)		$217.18	$1,188.00
HARVEST RED (CUSTOM)		$240.00	$0.00
HAUL GREEN		$231.38	$177.01
HAUL RED		$37.50	
	SUBTOTAL	$726.06	$1,365.01
POST HARVEST OPERATIONS			
SHREDDER		$10.86	$9.56
	SUBTOTAL	$10.86	$9.56
OVERHEAD EXPENSES			
DOWNTIME		$0.90	$4.21
EMPLOYEE BENEFITS		$2.78	$13.60
INSURANCE		$0.31	$1.51
LAND TAXES		$4.00	$1.76
SUPERVISION AND MANAGEMENT		$86.28	$122.97
OTHER EXPENSES		$107.08	$64.20
	SUBTOTAL	$201.34	$208.26
TOTAL OPERATING EXPENSES		$1,584.95	$2,451.26
NET OPERATING PROFIT		$2,040.30	$1,448.74
INTEREST ON OPERATING CAPITAL		$41.14	$26.71
INTEREST ON EQUIPMENT INVESTMENT		$58.37	$45.78
RETURN TO LAND AND RISK		$1,940.79	$1,376.25
*For complete Budgets see Appendix A			

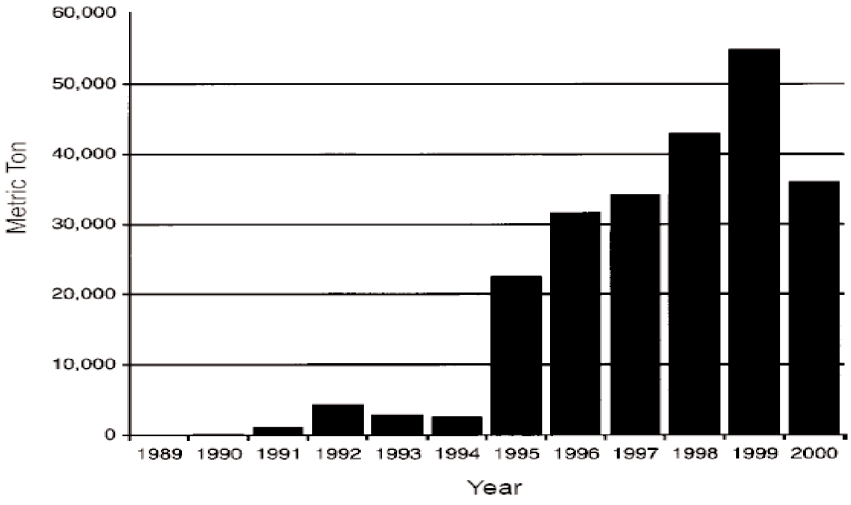
Source: Libbin, Hawkes, & Hibner, 2006

Figure 1. Global chile pepper production, 1998



Source: Chile Pepper Institute, 2001

Figure 2. Chile pepper imports from Mexico through New Mexico ports of entry



Source: Hall and Skaggs, 2003

Figure 3. Source of chile peppers used by New Mexico chile processors