COST AND RETURN COMPARISON OF SEVEN COTTON VARIETIES IN DELICIAS, CHIHUAHUA, MEXICO

Jose Eduardo Magaña Magaña,
Juvencio Gonzalez García,
Arturo J. Obando Rodríguez, Alvaro Anchondo Nájera and Sóstenes Delgado García
Universidad Autónoma de Chihuahua-Facultad de Ciencias Agrícolas y Forestales

Abstract

Growers from the north of México, particularly those in the state of Chihuahua are looking for crops with higher returns. Cotton should be the crop that could improve their returns via productivity. An interdisciplinary team conducted this study. Two transgenic cotton varieties: DP-33B, DP-90B and four non-transgenic cotton varieties: DP 5415, STONEVILLE 239, STONEVILLE 474, SURE GROW 125, FIBER MAX 963 were planted in Delicias, Chihuahua, Mexico. STONEVILLE 239, DP-90B, DP-33B, and SURE GROW were the outstanding yield varieties. The gross returns of STONEVILLE 239, DP-90B and DP-33B, and SURE GROW were higher by 55%, 54%, 51% and 44% than the gross returns of FIBER MAX 963. The promissory varietie for Delicias are STONEVILLE 239, DP-33B, DP-90B and SURE GROW 125.

Introduction

Growers from the north of México, particularly those in the state of Chihuahua, have been facing a severe drought since 1992. Consequently, the dams have not held enough water to irrigate the acreage in 1991. They are trying to be efficient in using the scarce water. Therefore, they are looking for crops with higher returns. Cotton should be the crop that could improve returns via productivity.

Producers from México and Chihuahua are trying to introduce new cotton varieties that will satisfy the requirements of high yield and quality, pest and disease resistance, and adaptability. The availability of water and the social pressure for achieving a sustainable agricultural development are demanding to employ new technology and to establish strategic and competitive agricultural policies.

Framework

Cotton is important because is the raw material to produce products to satisfy the basic need of dressing. Therefore, in the last ten years, it has been increasing its importance in the global market. The large producers-exporters and consumers have dominated the global cotton market. As a result, they have been setting up the international prices.

The boom for cotton exporters has reached its peak and they should take strategic actions to overcome their big problem, which is the increasing international cotton stock. According to Santiago (1999), the international cotton stock reached 9,000 tons that represents 49% of the world cotton consumption The large world cotton exporters have 75% of the international stocks. The large producers such as the United States, China, India, Pakistan, Uzbekistan and Turquia should reduce their acreage in the next years because the increasing international stocks has resulted in lower prices. Those countries will improve their returns via productivity by using advanced technology.

The Mexican annual consumption of cotton is around of 2.5 million of bales while the average Mexican cotton production has been about of 1.2 million of bales. In 1991, The acreage harvested of cotton was 248,677 hectares with a production of 558,670 tons, the highest production during the period 1990-1993 (Table 1). In 1992, the cotton production faced a dramatic acreage reduction caused by the severe drought season. The Mexican government established a development program for cotton, basically because the cotton processors did not have the facility to import cotton from USA, and it causes panic among the members of the textile industry. This program and the good prices increased the acreage planted during the period 1994-1997 in which, the production in 1996 was the highest (Table 1). However, it can be see that in 1998, the harvested acreage decreased 45.5% in comparison with 1996.

Table 1. Historical data of the Mexican cotton production, 1990-1999.

Year	Acreage planted (thousands ha)	Acreage harvested (thousands ha)	Yield (tons)
1990	223.8	219.8	2.43
1991	271.3	248.7	2.25
1992	49.7	46.2	2.00
1993	42.5	39.8	1.91
1994	175.4	168.9	2.01
1995	294.5	274.6	2.30
1996	314.8	306.9	2.50
1997	203.9	197.3	3.03
1998	234.0	167.2	2.02
1999*	148.3	90.0	1.80

*Data until October of 1999.
Source:Secretaría de Agricultura, Ganadería y Desarrollo Rural,1999.

In the period 1992-1997, the average harvested acreage in Mexico was 279,275 hectares with a volume of 0.962 million of bales. The average yield was 4.4 bales per hectare. The state of Baja California Norte was the largest producer at 26.75% of the Mexican cotton production. The state of Chihuahua was the second largest producer at 21.06% of the Mexican cotton production.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:340-343 (2000)
National Cotton Council, Memphis TN

The Mexican cotton industry is not integrated as a value added chain. Each member has been finding his own way to improve efficiency and to achieve higher returns. For example, the textile industry obtained a subsidy to buy cotton; however, they imported cotton from the United States not the domestic. Mexican cotton producers are price takers, this means that they do not have the market power to set up prices. Mexican farmers sell their cotton according to the international prices. Cotton farmers who support the all chain have been facing serious problems such as lack of credits, high interest rates, climate, high incidence of pests, commercialization, and the expensive technology. This tendency should decrease the cotton production for the next two years.

Table 2. Acreage planted by region. Chihuahua state.

Region	1997 hectares	1999 hectares	Changes %
South-center. Delicias-Jimenez-Ojinaga	12,525	5,700	-54.50%
North-west: Juarez-Casas Grandes-Ascensión-Villa Ahumada	33,400	32,000	-4.25%
Total	45,925	37,700	-17.91%

Source: SAGAR,Empresas Longoria, 1999.

There are two main regions in Chihuahua to produce cotton. The north-west that comprises: Juarez-Casas Grandes-Ascensión-Villa Ahumada and the south-center region: Delicias-Jimenez-Ojinaga. In 1999, the south-center region decreased dramatically its production with respect to 1997 while the north-west region had little change. In 1999, the Chihuahua cotton production was reduced 17.91% in comparison with the production in 1997 (figure 2). The average yield has been 3.5 ton/ha (5.83 bales/ha). The North-west region besides of its larger production has been achieving the good middling quality.

Objective

The objective of this study was to analyze and compare the costs and returns of seven cotton varieties planted in Delicias, Chihuahua.

Methodology

An interdisciplinary team conducted this study. In order to accomplish the objective, two transgenic cotton varieties: DP-33B, DP-90B and four non-transgenic cotton varieties: DP 5415, STONEVILLE 239, STONEVILLE 474, SURE GROW 125, FIBER MAX 963 were planted in Delicias, Chihuahua, Mexico. The experiment was analyzed as a randomized complete block design with four replicates. The useful Plot was two rows, the distance between rows was 0.90m, and each row had a length of 6m. The crop management process was according to the recommendations of the Delicias region. There were no applications for Bud/Bolworm in the transgenic varieties.

The enterprise budgets were estimated considering costs of each stage of the production process. The prices and costs estimated were converted to U.S. dollars according to an exchange rate of 9.50 Mexican pesos/ one U.S. dollar.

Economic Analysis

Table 3 shows a summary of the average production yelds of the seven cotton varieties. All the varieties under study yield more than the average yield of the region. STONEVILLE 239, DP-90B, DP-33B, and SURE GROW were the outstanding yield varieties. The average yield of STONEVILLE 474 was higher than the average yield of DP 5415 and FIBER MAX 963. FIBER MAX 963 had the lower average yield, however was little higher in comparison with the average yield in the region.

Table 3. Average cotton yield. Delicias, Chihuahua, México. 1999.

	Yield	
Variety	Tons/ha	Bales/ha
STONEVILLE 239	4.0749	6.7916
DP 90B	4.0570	6.7617
DP 33B	3.9850	6.6420
SURE GROW 125	3.7766	6.2944
STONEVILLE 474	3.4554	5.7591
DP 5415	3.1828	5.3046
FIBER MAX 963	2.6288	4.3814
Average yield in the region	2.5500	4.2500

and returns per hectare of cotton varieties.

Price was not reflected in gross returns. Yield made the difference between varieties. As a result, the gross returns of STONEVILLE 239, DP-90B and DP-33B, and SURE GROW were higher by 55%, 54%, 51% and 44% than the gross returns of FIBER MAX 963. STONEVILLE 474 was over by 31% than the gross return of FIBER MAX 963.

There were no significant differences between the operating expenses of transgenic varieties versus non-transgenic varieties. The seed costs of transgenic varieties were higher by $80 than the seed cost of the rest of varieties, however the Mexican government supported farmers that planted transgenic varieties with 20% of the cost of the seed.

The cost of pest control of the non-transgenic varieties was higher by (49%) than the cost of pest control of transgenic varieties. It appears to be that the higher seed cost of transgenic varieties was compensated by the lower cost of pest control as a result of their superior performance against the specific pests.

Table 4. Cost and return estimated in U.S. dollars per hectare without supporting programs. Delicious, Chihuahua. 1999.

Variety	Gross return 1bale=$240	Operating expenses plus interest	Return to land and risk
STONEVILLE 239	1,630	1,345	285
DP 90B	1,623	1,355	268
DP 33B	1,594	1,355	239
SURE GROW 125	1,511	1,345	166
STONEVILLE 474	1,382	1,345	37
DP 5415	1,273	1,345	-72
FIBER MAX 963	1,052	1,345	-293

Interest=cumulative=8.74%, license of transgenic=$70/ha

Table 4 shows The cost and return estimated without supporting STONEVILLE 239 and the transgenic varieties were the higher returns to land and risk because of its superior average yield. DP 5415 and FIBER MAX 963 had negative returns to land and risk because they lower yield.

Table5. Cost and return estimated in U.S. dollars per hectare with supporting programs. Delicias, Chihuahua. 1999.

Variety	Gross return plus supporting programs 1bale=$240	Operating expenses plus interest	Return to land and risk
STONEVILLE 239	1,815	1,345	470
DP 90B	1,808	1,355	453
DP 33B	1,779	1,355	424
SURE GROW 125	1,696	1,345	351
STONEVILLE 474	1,567	1,345	222
DP 5415	1,458	1,345	113
FIBER MAX 963	1,237	1,345	-108

Supporting programs=185 dollars

The crop production during 1999 was very difficult for the farmers from Chihuahua. They faced several problems like climate, high incidence of pests, and lack of water that caused a diminution of yield and a lost of quality. In addition, the international price did not react to the expected price that farmers had when they took the decision to grow cotton. As a consequence, the Mexican government implemented a special program to help cotton farmers. Table 5 shows the returns to land and risk with supporting programs. The varieties with higher yield increased their return. But, the FIBER MAX variety in spite of the supporting programs did not change to a positive return to land and risks.

Conclusion

"Suppliers of farmers are happy and rich, Intermediate and final Processors who utilize cotton like raw material are very happy and rich, Distributors and retailers who sell cotton products are increasing their returns and they are very happy, Consumers that buy cotton products are very happy because their necessities have been satisfied in the best manner, ¿why cotton farmers that face the uncertainty and the risk for growing cotton are not happy and rich?"

Lucas the Farmer

Chihuahua farmers, particularly those in Delicias are looking for new cotton varieties to increase their profit and the opportunity costs of water and land and to maintain the health of the environment. The outstanding varieties were the transgenic varieties DP-90B and DP-33B and STONEVILLE 239 and SURE GROW 125 for the non-transgenic varieties. This is the second year that these two transgenic were the promissory varieties for the south-center region. It is necessary that the Mexican government, Universities, experimental stations, farmers, processors, distributors and retailers have to work on the Mexican cotton value added chain. They will be integrated in the international cotton chain that is the best way for constructing the future of the global cotton industry and to reduce uncertainty and the risk.

References

Morales, J.S. and J.E. Magaña Magaña. 1998. Analisis del mercado de la mezclilla en Mexico. Universidad Autónoma de Chihuahua-Facultad de Ciencias Agricolas y Forestales. Cd. Delicias, Chihuahua.

Instituto Nacional de Estadistica Geografia e Informatica. 1999. Anuario estadistico del estado de Chihuahua. Aguascalientes, Ags.

Santiago, J. 1999. Panorama internacional del algodon. Revista la Nueva Era en la Agricultura,pp 8-9. Meister Publishing. Mexico, D.F.

Secretaria de Agricultura , Ganaderia y Desarrollo Rural. 1998. Superficie sembrada y cosechada de cultivos otoño-invierno y primavera-verano del periodo 1985-1997 del estado de Chihuahua. SAGAR. Chihuahua, Chihuahua.

Secretaria de Agricultura , Ganaderia y Desarrollo Rural. 1997. Superficie sembrada y cosechada de cultivos otoño-invierno y primavera-verano del periodo 1985-1997 del Distrito de Desarrollo 013. Cd. Delicias, Chihuahua.