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TECHNICAL REPORT

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ABSTRACT

The Air, Pesticides, and Toxics Division of the Environmental Protection Agency (EPA) has encouraged all states to develop a plan to manage the use of pesticides to prevent application that would result in unreasonable risks to human health and the environment from contamination of ground water. In February, 1988, EPA proposed a strategy where by they would regulate certain pesticides by prohibiting their use in areas vulnerable to leaching unless a state develops and implements a management plan acceptable to EPA. However, banning the use of a pesticide in a region is the worst case scenario available to the TWC for managing water quality.

The Texas Water Commission (TWC) assessed the State for areas vulnerable to leaching and found the Lower Rio Grande Valley (LRGV) to be a highly vulnerable area. This study examines three pesticides (atrazine, dicrotophos, and aldicarb) currently used in the LRGV that were identified by the TWC as potential contaminants of ground water. Alternative methods of controlling pests in this region were identified, and the economic impacts of withdrawing one or all three of these pesticides from the study area were estimated.

Regional impacts on gross receipts (sales), variable costs, and net returns were determined. If atrazine use were banned in the LRGV, corn and sorghum sales would decrease by approximately $1 million, variable costs to produce corn, sorghum, and sugarcane would increase by almost $2 million dollars, leaving farmers in the region with a $3 million dollar loss in net income per year. If dicrotophos use were prohibited in the LRGV, variable cost to produce cotton would increase by over $600,000 for the region as a whole. Banning aldicarb use in the study area would reduce citrus sales by almost $3 million, increase variable costs to produce citrus by over $200,000, and reduce farmer net income by over $3 million annually.

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INTRODUCTION

The Air, Pesticides, and Toxics Division of the Environmental Protection Agency (EPA) has encouraged all states to develop a plan to manage the use of pesticides to prevent application that would result in unreasonable risks to human health and the environment from contamination of ground water. In February, 1988, EPA proposed a strategy where by they would regulate certain pesticides by prohibiting their use in areas vulnerable to leaching unless a state develops and implements a management plan acceptable to EPA. A state implemented plan can provide protection for ground-water resources without unnecessarily restricting pesticide use (Texas Groundwater Protection Committee, 1991).

As part of the Texas State Management Plan for Agricultural Chemicals in Ground Water, a water monitoring program will be designed and conducted. Results of continued monitoring and implementation of BMPs will be evaluated to continually refine the chemical specific management plan (Texas Groundwater Protection Committee, 1991).

Several agencies in Texas have responsibilities for protection and conservation of ground-water resources as outlined in the Texas State Management Plan for Agricultural Chemicals in Ground Water. One such agency is the Texas Water Commission (TWC). In the event that ground water contamination has occurred, the following management options can be taken by the TWC to manage non-point source pollution:

1) increasing BMP awareness and implementation,
2) designating a pesticide as state-limited use to further restrict conditions in which the product can be used,
3) recommend modifying pesticide labels,
4) canceling or suspending a State pesticide registration,
5) requesting a change in the pesticide formulation,
6) requiring remediation of ground water resources,
7) develop a chemical specific management plan,
8) initiating new legislation or modifying existing legislation, and
9) exercising appropriate enforcement action (Texas Groundwater Protection Committee, 1991).

The Texas Water Commission assessed the State for areas vulnerable to leaching using DRASTIC, an EPA-developed index which combines hydrologic

settings with climate data to derive relative ground water pollution potential ratings. DRASTIC scores depict pollution potential which may result from widespread, surface-applied chemicals such as fertilizers and pesticides (Texas Water Commission, 1989). Two regions that have high DRASTIC scores and have widespread, surface-applied chemicals are the Lower Rio Grande Valley (LRGV), especially in Cameron and Willacy counties, and the Coastal Bend.

While the regulations outlined above govern ground water, similar type management plans for surface water are expected to be developed as the State responds to the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). CZARA named the EPA as originator and administrator of management measures pertaining to coastal non-point pollution under the umbrella of the Clean Water Act. States are required to develop programs to manage surface water quality or face reductions in federal funding beginning in FY1996 (Wyse *et al.* 1992).

The importance society has placed on water quality is reflected in the Clean Water Act and the President's Water Quality Initiative. Potential contamination of water supplies by agricultural pesticides is an important issue. Pesticides help growers provide large quantities of food at relatively low prices to American consumers. Many agricultural producers are also concerned with the environment (Thomas *et al.* 1993). However, pesticides and nitrates have been detected in some ground and surface water of the U.S.

Several studies have analyzed pesticide and nutrient bans. Some of these have considered withdrawal of all pesticides rather than specific chemicals (i.e. Lacewell and Masch, 1972; Knutson, *et al* 1990). These studies typically showed a large cost increase to consumers due to less crop production and higher cost of production. The effect on agricultural producers varied according to dependence upon chemical inputs. The southern U.S. was a region where agricultural producers used more pesticides due to the favorable environment for pests.

The extent to which pesticide use endangers ground or surface water quality depends on a number of factors. Some of these factors include seasonal rainfall, proximity to ground or surface water, soil type, the physical characteristics of the pesticide, the quantity of the pesticide used in a restricted area, and agricultural production practices. Pesticides with persistent residues and a tendency to leach or run off are the most likely candidates to be found in water supplies. If such pesticides are used intensively near bodies of water, detection of the pesticide in the water is more likely to occur.

This study examines three pesticides in the LRGV that were identified by the TWC as potential contaminants of ground water. These three pesticides, atrazine, dicrotophos, and aldicarb, are used in large quantities in this region, have persistent residues, and have a tendency to leach or run off. The objective of this study was to identify alternative methods of controlling pests in this region, and consequently estimate the economic impact on a per acre, whole farm, and regional basis, of withdrawing one or all three of these pesticides from the study area. It is important to emphasize that banning of any pesticide is an extreme position for implementing pesticide management should there be some contamination of water.

STUDY AREA

The LRGV consists of four counties in the southernmost tip of Texas (Figure 1). The area has over 700,000 acres of crop land and approximately 900,000 acres in range and pasture (Bureau of the Census, 1989). The primary row crops are sorghum, cotton, corn and sugarcane (Table 1). In addition, the LRGV produces citrus and vegetables. Approximately 60% of the cropland is irrigated. Starr county has less cropland and fewer irrigated acres than the other three counties (Table 1). Some form of pesticide is used on the majority of the cropland acres with a less intensive use on some of the range and pasture acres.

The LRGV is bordered on the south by the Rio Grande and on the east by the Laguna Madre. Much of the area has a system of drainage ditches that carry irrigation and rainfall runoff to the Laguna Madre. Areas that do not have a drainage system are often plagued with a high water table that rises within inches of the soil surface (Robinson *et al.* 1992).

Responding to a need for information on the distribution of use of pesticides and fertilizers within the State, the Texas Agricultural Extension Service conducted an intensive survey of county extension agents and specialists to develop estimates of chemical use by crop within each county. Based on the statewide estimates, the Agricultural Chemicals Subcommittee of the Texas Ground Water Task Force selected the 10 pesticides with greatest potential to contaminate ground water by virtue of the quantities used and their ability to leach through soils (Jordan *et al.* 1992). Chemical use in the LRGV is displayed in Table 2. Six of these 10 pesticides are used intensively in the LRGV. Atrazine, dicrotophos, and aldicarb were the focus of this study.

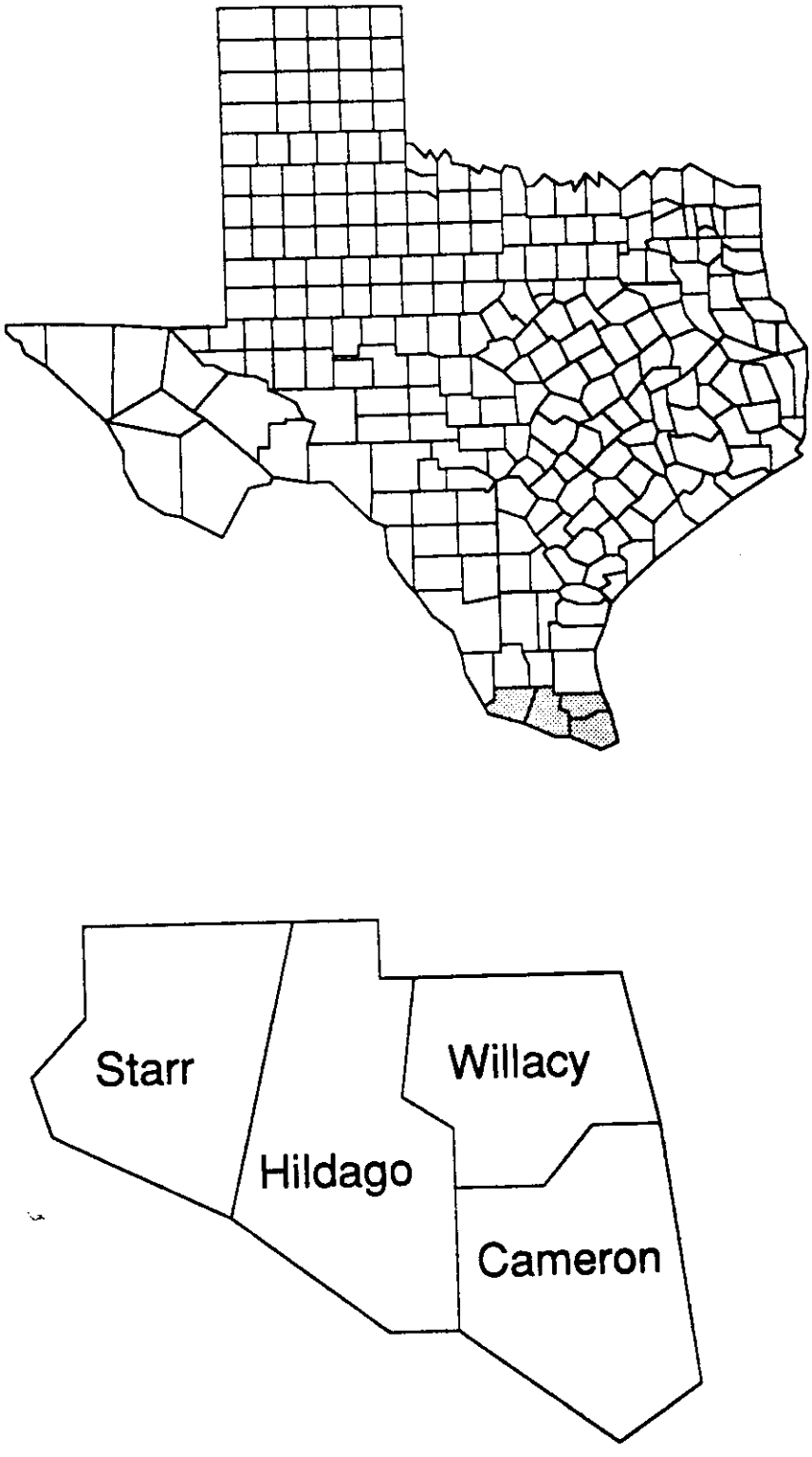

Figure 1. The Lower Rio Grande Valley

Table 1. Harvested Acres and Total Production in 1987 in the LRGV †.

Crop	Harvested Acres					Production
	by County				Total	
	Cameron	Hidalgo	Starr	Willacy		
	acres					
Irrigated Corn	17,625	23,159	21	1,689	42,494	
Total Corn	19,780	26,904	3,074	7,353	57,111	4,282,755 bu.
Irrigated Cotton	55,288	47,236	(D)‡	5,558	108,082	
Total Cotton	91,454	71,432	20,202	72,927	256,015	334,279 bale
Irrigated Sorghum	19,080	15,682	175	2,663	37,600	
Total Sorghum	46,326	88,903	76,281	65,727	277,237	18,713,219 bu.
Citrus	5,312	32,987	0	898	39,197	
Sugarcane	5,312	25,578	0	1,645	32,535	
Onions	747	7,784	0	0	8,531	
Irrigated Soybeans	(D)	270	(D)	0		7,850 bu.
Irrigated Wheat	832	643	0	0		
Total Wheat	2,090	779	104	(D)		87,460 bu.
Irrigated Hay	2,340	3,067	720	122	6,249	
Total Hay	3,076	8,632	7,399	1,027	20,134	40,428 ton

†Source: Bureau of the Census.
‡(D) indicates information withheld to avoid disclosing data for individual farms.

PROCEDURES

The first step in this study was to identify which of the 10 selected pesticides were used in the LRGV and the nature of their use. Important to this was a review of survey data on pesticide use by county (Holloway). In addition, professional opinions of practicing agricultural scientists in the study area were critical in determining the factors that constrain grower choices and affect pest treatment efficacy. Estimates of average application rates for the currently used pesticides, atrazine, dicrotophos and aldicarb, were obtained and used to determine the cost per treatment and per acre for each relevant crop.

Table 2. Estimates of Chemical Use by County: LRGV †.

Pesticide	Chemical Use by County				
	Cameron	Hidalgo	Starr	Willacy	Total
	acres treated ‡				
Atrazine	79,050	71,320	0	63,000	213,370
Dicrotophos	33,250	86,400	0	30,000	149,650
Aldicarb	9,500	4,000	0	0	13,500
Methomyl	0	11,870	15,000	5,575	32,445
Carbofuran	31,500	6,270	0	0	37,770
Dicamba	23,375	1,700	0	0	25,075
Chlorosulfuron	0	0	0	0	0
Metolachlor	0	0	0	0	0
Metolachlor + Atrazine	0	0	0	0	0
Picloram + 2,4-D	0	0	0	0	0

†Source: Rodney Holloway, Texas Agricultural Extension Service. Average use data for 1987, 1988 and 1989.

‡Acres receiving treatment with more than one pesticide or multiple applications of the same pesticide are counted each time.

The second step was to estimate the per acre economic impacts of withdrawing the three pesticides considered. Agricultural scientists formulated the next best pest management strategy assuming that none of the 10 chemicals listed in Table 2 were available. The strategies involved use of alternative pesticides, tillage practices and other cropping activities. Individuals who had been involved in similar studies for the study area were contacted. No published results from these earlier studies were available, but conversations with the researchers proved most helpful (Anciso; Lockomy; Weaver).

Crop enterprise budgets were used to determine changes in per acre costs and returns if the alternative pest management practices were adopted. Base crop enterprise budgets (Taylor) were obtained for the crops involved, and alternative crop enterprise budget were developed assuming the alternative

pesticide and cropping practice were used. The base and alternative budgets were compared to determine the expected changes in gross income, variable cost, and net income per acre if the case study pesticides were no longer available to growers in the LRGV. Information on number of pesticide treatments needed, additional cultivations needed, and yield impacts were provided by experts through a survey instrument and follow-up enumeration.

The third step was to estimate the direct farm economic impacts to the region. Since changes in yields and cost were relatively small, and because the changes to corn and sorghum were very similar, it was assumed that cropping patterns would not change if the three case study pesticides were withdrawn from use. A farm level profit maximization model built for the study area confirmed this assumption. Therefore, the expected economic impacts to agricultural producers in the region can be obtained by multiplying the per acre impacts by the number of acres affected. The data on acres treated with each pesticide provided by Holloway could not be utilized for this part of the analysis because the crops treated were not identified. Therefore, the number of acres planted in 1987 of each crop for the study area were obtained from the Census of Agriculture. The percent of the total acres planted that currently use the pesticides slated for withdrawal were provided by the panel of agricultural scientists. Discrepancies between the two estimates of acres treated are probably due to the difference in experts providing the estimates and the fact that the experts in this study were estimating percent of acres treated for 1992.

RESULTS

Atrazine is currently used on corn, sorghum, and sugarcane acreage in the study area. It is the most effective and least expensive herbicide to control broadleaf weeds and annual grasses. In the absence of atrazine, cyanazine is the next best alternative for corn and sorghum, but is not labeled for sugarcane. Ametryne is the next best alternative to atrazine for sugarcane. Application rates, costs of material, and costs per treatment of these alternative herbicides are displayed in Table 3. Treatment costs per acre increase by $8.25 for corn, $5.75 for sorghum, and $5.72 for sugarcane.

In addition to the increased cost of the alternative herbicides, the number of herbicide applications and cultivations needed must also be considered. Corn and sorghum are expected to require an additional cultivation if using cyanazine. Sugarcane requires two applications per year of either atrazine or

ametryne. These factors together resulted in an estimated increase in variable costs per acre of $10.49 for corn, $7.99 for sorghum, and $11.44 for sugarcane (Table 4).

Dicrotophos is currently the most cost effective insecticide for fleahopper control in cotton for the study area. The next best alternative is acephate. Acephate costs $1.56 more per acre for each treatment (Table 3). Producers in this area make one to two fleahopper treatments per year which translates to an average cost increase of $2.34 per acre (Table 5). Using acephate instead of dicrotophos is not expected to impact cotton yields. Some producers are already using acephate instead of dicrotophos.

Most of the citrus producers in the LRGV use one ground application of aldicarb per year to control mites. If aldicarb was banned in this region, citrus growers would be expected to use two foliar applications of fenbutatin-oxide to control mites. This is expected to increase variable costs by $19.90 per acre (Table 5).

Discontinued use of these pesticides in the LRGV could reduce yields of some crops which, in turn, would reduce gross income. Yields are expected to decline by 3% for corn and 2% for sorghum if cyanazine was used instead of atrazine, and 10% for citrus if aldicarb was not available for use. The crop enterprise budgets used to determine changes in gross income, variable cost, and net income are presented in the Appendix. The estimated reduction in gross income from citrus is $297 per acre if aldicarb is not available. Combining this with a $21.40 increase in variable cost results in a $318.40 reduction in net income per acre (Table 6). Changes in net income per acre for row crops are much smaller than for citrus ranging from $2.42 for cotton to $14.79 for corn (Table 6). The $12.45 reduction in net income for dryland sorghum is similar to results obtained by Bean *et al.* (1991) who estimated a $13.13 reduction in net income per acre for sorghum growers when atrazine was not available on the Texas High Plains.

The per acre estimates of changes in gross income, variable cost, and net income were used to estimate economic impacts to producers in the LRGV as a whole. While some of the per acre changes in net income for row crops would be sizeable, they would not be expected to be large enough to cause a change in cropping patterns. Citrus might represent an exception due to the large yield decline. In this case the average number of acres planted to each crop would not

Table 3. Application Rates and Cost per Treatment of Alternative Pesticides in the LRGV.

Crop	Pesticide Name		Pest	Formulation†	Application Rate		unit	Insecticide	Cost of Treatment		
	Brand	Common			low	high		Price ($/unit)	low ($/acre)	high ($/acre)	average ($/acre)
Corn											
	AAtrex 4L	Atrazine	BL weeds	4 lb ai/gal	1.50	1.50	qt	$3.50	$5.25	$5.25	$5.25
	Bladex	Cyanazine	BL weeds	4 lb ai/gal	2.00	2.00	qt	$6.75	$13.50	$13.50	$13.50
Sorghum											
	AAtrex 4L	Atrazine	BL weeds	4 lb ai/gal	1.25	1.25	qt	$3.50	$4.38	$4.38	$4.38
	Bladex	Cyanazine	BL weeds	4 lb ai/gal	1.50	1.50	qt	$6.75	$10.13	$10.13	$10.13
Sugarcane											
	AAtrex 4L	Atrazine	BL weeds	4 lb ai/gal	2.00	3.00	qt	$3.50	$7.00	$10.50	$8.75
	Evik 80 W	Ametryne	BL weeds	80%	2.50	3.75	lbs	$4.63	$11.58	$17.36	$14.47
Cotton											
	Bidrin	Dicrotophos	fleahopper	8 lbs ai/gal	0.01	0.06	gal	$84.00	$1.05	$5.25	$3.15
	Orthene 90S	Acephate	fleahopper	90%	0.25	1.00	lb	$7.54	$1.89	$7.54	$4.71
Citrus											
	Temik	Aldicarb	mites		33.00	33.00	lbs	$4.20	$138.60	$138.60	$138.60
	Vendex 4L	Fenbutatin -Oxide	mites	4 lb ai/gal	0.25	0.50	gal	$160.25	$40.06	$80.13	$60.09

† ai stands for active ingredients.

‡ BL weeds = broadleaf weeds.

Table 4. Costs per Treatment, Number of Treatments, Cost Differences, and Yield Differences of Alternative Herbicides.

	Corn		Sorghum		Sugarcane	
	Atrazine	Cyanazine	Atrazine	Cyanazine	Atrazine	Ametryne
Cost of Chemical per Treatment ($)	5.25	13.50	4.38	10.13	8.75	14.47
Application Cost per Treatment ($)	2.50	2.50	2.50	2.50	1.50	1.50
Total Cost per Treatment ($)	7.75	16.00	6.88	12.63	10.25	15.97
Number of Treatments	1	1	1	1	2	2
Total Cost Per Season ($)	7.75	16.00	6.88	12.63	20.50	31.94
Cultivations	2	3	2	3	No Change	
Cost per Cultivation ($)	2.24	2.24	2.24	2.24		
Total Cost of Cultivations ($)	4.48	6.72	4.48	6.72		
Sum of Totals ($)	12.23	22.72	11.36	19.35	20.50	31.94
Difference ($)	10.49		7.99		11.44	
Yield impacts	-2%		-3%		0	

be affected. The changes in gross income, variable cost, and net income for the LRGV under this scenario are presented in Table 7.

If atrazine were banned from the LRGV, sales of corn and sorghum were estimated to decline by over one million dollars. This is approximately a 3% reduction in corn and sorghum sales. Turning to a withdrawal of the three pesticides, net income to corn, sorghum, and citrus producers was estimated to decline by almost four million dollars in the study area as a whole. Net returns to farmers was estimated to decline by $6.7 million per year. This represents a reduction in sales of $4.0 million and an increase in cost of $2.7 million.

Table 5. Costs per Treatment, Number of Treatments, Cost Differences, and Yield Differences of Alternative Insecticides.

	Cotton		Citrus	
	Dicrotophos	Acephate	Aldicarb	No Aldicarb
Cost of Chemical per Treatment ($)	3.15	4.71	138.60	60.00
Application Cost per Treatment ($)	1.50	1.50	1.50	20.00
Total Cost per Treatment ($)	4.65	6.21	140.10	80.00
Number of Treatments	1.5	1.5	1	2
Total Cost Per Season ($)	6.98	9.32	140.10	160.00
Difference ($)	2.34		19.90	
Yield impacts	0		-10%	

CONCLUSIONS

If the three pesticides studied here were banned for the LRGV, farmers and rural economies in this area would be impacted negatively. Citrus growers stand to lose the most from the banning of aldicarb, and most of this impact is the result of the projected 10% decline in crop yields. Returns to fixed costs and management would decline by six to eight percent for the row crops, excluding cotton. Producer's net incomes would decline by at least these amounts and probably more depending on the debt structure of the individual farmer. The net income available from dryland sorghum production was estimated to decline by 23% assuming fixed costs are as depicted in the crop enterprise budget. Even a six or eight percent reduction in net income is not a small matter for most American households.

In addition to atrazine, aldicarb, and dicrotophos; methomyl is an important insecticide in the valley used on onions to control thrips. However, identifying an alternative insect treatment was difficult because the most effective insecticide against thrips on onions is not currently labeled for onions. Therefore, the economic impacts of banning methomyl in the study area were not quantified. Vegetables are a high value crop similar to citrus, so the effects may be quite large.

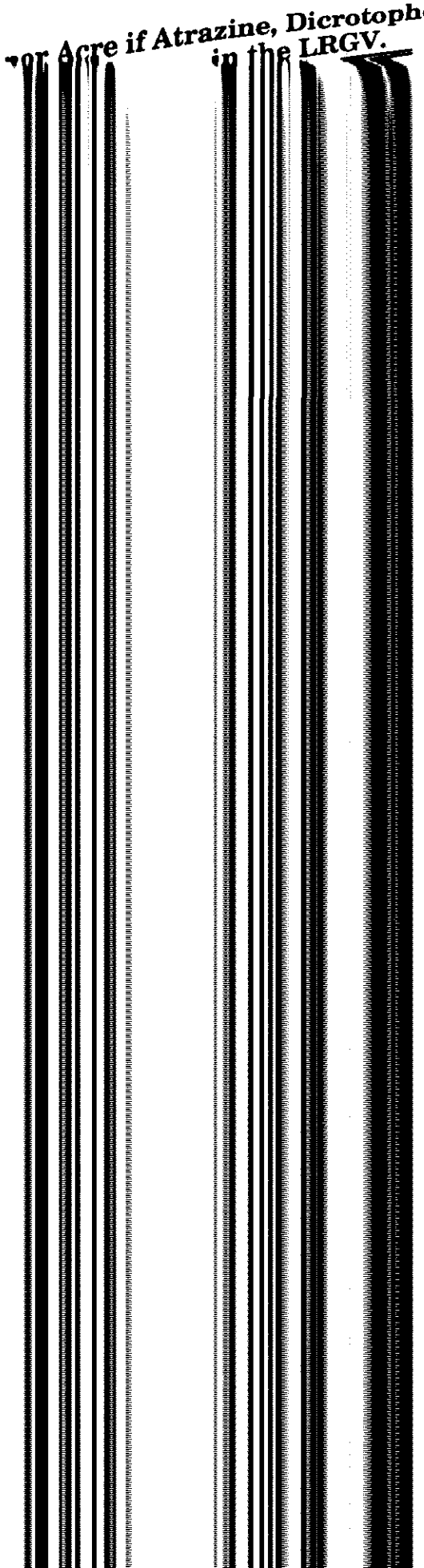
Per Acre if Atrazine, Dicrotophos,
in the LRGV.

Table 6. Changes in Cost and Income per Acre if Atrazine, Dicrotophos, and Aldicarb were not Available to Farmers in the LRGV.

	Gross Income			Variable Cost			Net Income	
Crop	Base †	Change		Base ‡	Change		Change	
	($)	($)	(%)	($)	($)	(%)	($)	(%)
Corn								
Irrigated	224.25	-4.48	-2.0	206.72	10.31	5.0	-14.79	-10.9
Sorghum								
Irrigated	253.50	-7.60	-3.0	233.97	7.09	3.0	-14.69	-12.0
Dryland	141.96	-5.07	-3.0	89.18	7.38	8.0	-12.45	-23.0
Sugarcane	990.00	0.00	0.0	783.00	11.44	1.5	- 11.44	-10.0
Cotton								
Irrigated	617.18	0.00	0.0	423.79	2.42	0.6	- 2.42	- 4.6
Dryland	411.45	0.00	0.0	220.18	2.46	1.0	- 2.46	- 2.8
Citrus	2,970.00	-297.00	-10.0	866.82	21.40	2.5	-318.40	- 20.2

† Gross income per acre using atrazine, dicrotophos, and aldicarb.
‡ Variable cost per acre using atrazine, dicrotophos, and aldicarb.

Atrazine is a triazine herbicide. If atrazine was banned, it is possible that all triazine herbicides would be banned. The alternative to atrazine assumed in this study is another triazine herbicide. If all triazine herbicides were banned, the variable cost impacts, and especially the yield impacts will be greater than those depicted in this study.

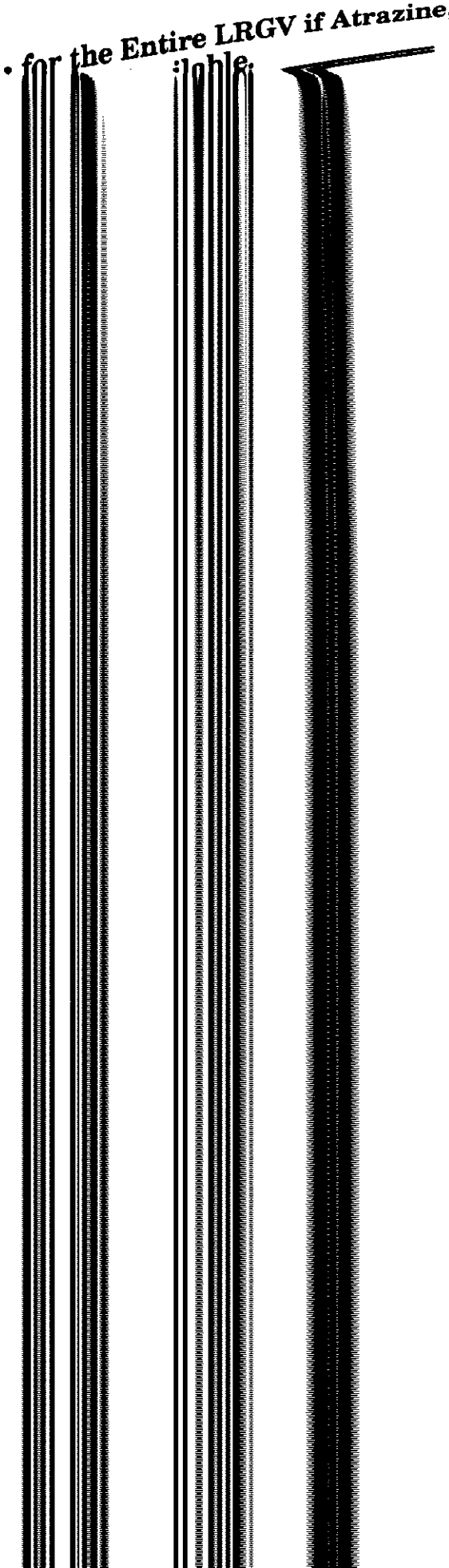
• for the Entire LRGV if Atrazine,
ilable.

Table 7. Changes in Cost and Income for the Entire LRGV if Atrazine, Dicrotophos, and Aldicarb were not Available.

Crop	Acres † Harvested	Acres ‡ Affected	Change in Gross Income	Change in Variable Cost	Change in Net Income
	(acres)	(%)			
Corn					
Irrigated	42,494	85%	($161,817)	$372,396	($534,213)
Sorghum					
Irrigated	37,600	60%	($171,456)	$159,950	($331,406)
Dryland	239,637	60%	($728,976)	$1,061,113	($1,790,088)
Sugarcane	32,535	100%	$0	$372,200	($372,200)
Cotton					
Irrigated	108,082	100%	$0	$265,882	($265,882)
Dryland	147,933	100%	$0	$357,998	($357,998)
Citrus	12,000§	80%	($2,851,200)	$205,440	($3,056,640)
			========	========	========
TOTALS			($3,913,449)	$2,794,979	($6,708,428)

†Bureau of the Census, 1989.
‡Suggested by expert opinion
§Due to hard freezes in recent years, only 12,000 acres are bearing fruit.

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APPENDIX

CROP ENTERPRISE BUDGETS

CORN, IRRIGATED, with ATRAZINE
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$/Unit	Total
CORN	75	bu.	2.56	192.00
DEFICIENCY PMT. CORN	75	bu.	0.43	32.25
Total GROSS Income				224.25

VARIABLE COST Description	Quantity	Unit	Unit	Total
PREHARVEST				
NITROGEN (DRY)	150	*lb.*	0.31	46.50
PHOSPHATE	50	*lb.*	0.29	14.50
SEED	10	*lb.*	1.3	13.00
HERBICIDE	1	acre	4.35	5.25
INSECTICIDE	1	acre	11	11.00
IRRIGATION	18	AcIn	1.333	23.99
Fuel & Lube - Machinery		Acre		12.07
Repairs - Machinery		Acre		3.86
Labor - Machinery	3.603	Hour	5.001	18.02
-Irrigation	4.5	Hour	4.5	20.25
Total PREHARVEST				168.44
HARVEST				
CUSTOM HARVEST	1	acre	20	20.00
CUSTOM HAULING	44.775	cwt.	0.2	8.96
Total HARVEST				28.96
Interest - OC Borrowed	77.715	Dol.	0.12	9.3258
Total VARIABLE COST				206.72
GROSS INCOME minus VARIABLE COST				17.527

FIXED COST Description	Unit	Total
Machinery and Equipment	Acre	62.75
Land	Acre	90.00
Total FIXED Cost		152.75
Total of ALL Cost		359.47
NET PROJECTED RETURNS		-135.22

CORN, IRRIGATED, with CYANAZINE
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$/Unit	Total
CORN	73.5	bu.	2.56	188.16
DEFICIENCY PMT. CORN	73.5	bu.	0.43	31.61
Total GROSS Income				219.77

VARIABLE COST Description	Quantity	Unit	Unit	Total
PREHARVEST				
NITROGEN (DRY)	150	*lb.*	0.31	46.50
PHOSPHATE	50	*lb.*	0.29	14.50
SEED	10	*lb.*	1.3	13.00
HERBICIDE	1	acre	11.56	13.50
INSECTICIDE	1	acre	11	11.00
IRRIGATION	18	AcIn	1.333	23.99
Fuel & Lube - Machinery		Acre		12.99
Repairs - Machinery		Acre		4.14
Labor - Machinery	3.81	Hour	5.001	19.06
-Irrigation	4.5	Hour	4.5	20.25
Total PREHARVEST				178.93
HARVEST				
CUSTOM HARVEST	1	acre	20	20.00
CUSTOM HAULING	43.8795	cwt.	0.2	8.78
Total HARVEST				28.78
Interest - OC Borrowed	77.715	Dol.	0.12	9.3258
Total VARIABLE COST				217.03
GROSS INCOME minus VARIABLE COST				2.7343

FIXED COST Description	Unit	Total
Machinery and Equipment	Acre	62.75
Land	Acre	90.00
Total FIXED Cost		152.75
Total of ALL Cost		369.78
NET PROJECTED RETURNS		-150.02

SORGHUM, IRRIGATED, with ATRAZINE
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$/Unit	Total
DEFICIENCY PMT. SORGHUM	50	cwt.	1.01	50.50
SORGHUM	50	cwt.	4.06	203.00
Total GROSS Income				253.50

VARIABLE COST Description	Quantity	Unit	$/Unit	Total
PREHARVEST				
NITROGEN (DRY)	120	lb.	0.31	37.20
PHOSPHATE	60	*lb.*	0.29	17.40
SEED	8	*lb.*	0.7	5.60
HERBICIDE	1	acre	2.9	4.38
INSECTICIDE	7	appl	1.8	12.60
PESTICIDE APPL.	7	acre	4.5	31.50
IRRIGATION	18	AcIn	1.333	23.99
Fuel & Lube - Machinery		Acre		14.10
Repairs - Machinery		Acre		4.72
Labor - Machinery	4.015	Hour	5.001	20.08
- Irrigation	4.5	Hour	4.5	20.25
Total PREHARVEST				191.82
HARVEST				
CUSTOM HARVEST	50	cwt.	0.4	20.00
CUSTOM HAULING	50	cwt.	0.2	10.00
Total HARVEST				30.00
Interest - OC Borrowed	101.222	Dol.	0.12	12.15
Total VARIABLE COST				233.97
GROSS INCOME minus VARIABLE COST				19.53

FIXED COST Description	Unit	Total
Machinery and Equipment	Acre	71.64
Land	Acre	70.00
Total FIXED Cost		141.64
Total of ALL Cost		375.61
NET PROJECTED RETURNS		-122.11

SORGHUM, IRRIGATED, with CYANAZINE
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$/Unit	Total
DEFICIENCY PMT. SORGHUM	48.5	cwt.	1.01	48.99
SORGHUM	48.5	cwt.	4.06	196.91
Total GROSS Income				245.90

VARIABLE COST Description	Quantity	Unit	$/Unit	Total
PREHARVEST				
NITROGEN (DRY)	120	lb.	0.31	37.20
PHOSPHATE	60	*lb.*	0.29	17.40
SEED	8	*lb.*	0.7	5.60
HERBICIDE	1	acre	5.78	10.13
INSECTICIDE	7	appl	1.8	12.60
PESTICIDE APPL.	7	acre	4.5	31.50
IRRIGATION	18	AcIn	1.333	23.99
Fuel & Lube - Machinery		Acre		15.02
Repairs - Machinery		Acre		5.00
Labor - Machinery	4.22	Hour	5.001	21.12
- Irrigation	4.5	Hour	4.5	20.25
Total PREHARVEST				199.81
HARVEST				
CUSTOM HARVEST	48.5	cwt.	0.4	19.40
CUSTOM HAULING	48.5	cwt.	0.2	9.70
Total HARVEST				29.10
Interest - OC Borrowed	101.222	Dol.	0.12	12.15
Total VARIABLE COST				241.06
GROSS INCOME minus VARIABLE COST				4.83

FIXED COST Description	Unit	Total
Machinery and Equipment	Acre	71.64
Land	Acre	70.00
Total FIXED Cost		141.64
Total of ALL Cost		382.70
NET PROJECTED RETURNS		-136.81

SORGHUM, DRYLAND, with ATRAZINE
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$/Unit	Total
DEFICIENCY PMT. SORGHUM	28	cwt.	1.01	28.28
SORGHUM	28	cwt.	4.06	113.68
Total GROSS Income				141.96

VARIABLE COST Description	Quantity	Unit	Unit	Total
PREHARVEST				
NITROGEN (DRY)	30	*lb.*	0.31	9.30
SEED	5	*lb.*	0.7	3.50
HERBICIDE	1	acre	2.9	4.38
INSECTICIDE	1	appl	1.8	1.80
PESTICIDE APPL.	1	acre	4.5	4.50
INSECTICIDE	1	appl	1.8	1.80
PESTICIDE APPL.	1	acre	4.5	4.50
Fuel & Lube - Machinery		Acre		12.96
Repairs - Machinery		Acre		4.25
Labor - Machinery	3.823	Hour	5	19.12
Total PREHARVEST				66.11
HARVEST				
CUSTOM HARVEST	28	cwt.	0.4	11.20
CUSTOM HAULING	28	cwt.	0.2	5.60
Total HARVEST				16.80
Interest - OC Borrowed	52.322	Dol.	0.12	6.28
Total VARIABLE COST				89.184

GROSS INCOME minus VARIABLE COST	52.776

FIXED COST Description	Unit		Total
Machinery and Equipment	Acre		66.71
Land	Acre		40.00
Total, FIXED Cost			106.71
Total of ALL Cost			195.89
NET PROJECTED RETURNS			-53.93

SORGHUM, DRYLAND, with CYANAZINE
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$/Unit	Total
DEFICIENCY PMT. SORGHUM	27	cwt.	1.01	27.27
SORGHUM	27	cwt.	4.06	109.62
Total GROSS Income				136.89

VARIABLE COST Description	Quantity	Unit	Unit	Total
PREHARVEST				
NITROGEN (DRY)	30	*lb.*	0.31	9.30
SEED	5	*lb.*	0.7	3.50
HERBICIDE	1	acre	5.78	10.13
INSECTICIDE	1	appl	1.8	1.80
PESTICIDE APPL.	1	acre	4.5	4.50
INSECTICIDE	1	appl	1.8	1.80
PESTICIDE APPL.	1	acre	4.5	4.50
Fuel & Lube - Machinery		Acre		13.88
Repairs - Machinery		Acre		4.53
Labor - Machinery	4.028	Hour	5	20.14
Total PREHARVEST				74.08
HARVEST				
CUSTOM HARVEST	27	cwt.	0.4	10.80
CUSTOM HAULING	27	cwt.	0.2	5.40
Total HARVEST				16.20
Interest - OC Borrowed	52.322	Dol.	0.12	6.28
Total VARIABLE COST				96.56

GROSS INCOME minus VARIABLE COST	40.33

FIXED COST Description	Unit		Total
Machinery and Equipment	Acre		66.71
Land	Acre		40.00
Total, FIXED Cost			106.71
Total of ALL Cost			203.27
NET PROJECTED RETURNS			-66.38

PLANT CANE...ATRAZINE
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ / Unit	Total
SUGAR CANE	54	ton	20	1050.00
Total GROSS Income				1080.00

VARIABLE COST Description	Quantity	Unit	$ Unit	Total
ATRAZINE	2	appl	10.25	20.50
NITROGEN (DRY)	80	lb.	0.31	24.80
IRRIGATION	6	AcIn	1.333	8.00
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
IRRIGATION	18	AcIn	1.333	23.99
SCOUTING	1	acre	1.5	1.50
IRRIGATION	24	AcIn	1.333	31.99
NITROGEN (DRY)	40	lb.	0.31	12.40
PHOSPHATE	200	lb.	0.29	58.00
HERBICIDE	1	appl	35	35.00
PLANT CANE	3	ton	40	120.00
IRRIGATION	6	AcIn	1.333	8.00
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
Fuel & Lube - Machinery		Acre		16.54
Repairs-Machinery		Acre		5.48
Labor-Machinery	5.89	Hour	5.001	29.46
-Other	16	Hour	4.5	72.00
-Irrigation	13.5	Hour	4.5	60.75
HARVEST				
BURN & HARVEST	54	ton	5.88	317.52
Total HARVEST				317.52
Interest - OC Borrowed	328.79	Dol.	0.12	39.45
Total VARIABLE COST				942.38

Break-Even Price, Total Variable Cost $17.45 per ton of sugar cane

GROSS INCOME minus VARIABLE COST 137.62

FIXED COST Description	Uri i t		Total
Machinery and Equipment	Acre		168.08
Land	Acre		70.00
Total FIXED Cost			238.08

Break-Even Price, Total Cost $21.86 per ton of sugar cane

Total of ALL Cost 1180.46

NET PROJECTED RETURNS -100.46

Projections for Planning Purposes Only B-1241(CI2)

PLANT CANE...AMETRYN
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ / Unit	Total
SUGAR CANE	54	ton	20	1050.00
Total GROSS Income				1080.00

VARIABLE COST Description	Quantity	Unit	$ Unit	Total
AMETRYN	2	appl	15.97	31.94
NITROGEN (DRY)	80	lb.	0.31	24.80
IRRIGATION	6	AcIn	1.333	8.00
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
IRRIGATION	18	AcIn	1.333	23.99
SCOUTING	1	acre	1.5	1.50
IRRIGATION	24	AcIn	1.333	31.99
NITROGEN (DRY)	40	lb.	0.31	12.40
PHOSPHATE	200	lb.	0.29	58.00
HERBICIDE	1	appl	35	35.00
PLANT CANE	3	ton	40	120.00
IRRIGATION	6	AcIn	1.333	8.00
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
Fuel & Lube - Machinery		Acre		16.54
Repairs-Machinery		Acre		5.48
Labor-Machinery	5.89	Hour	5.001	29.46
-Other	16	Hour	4.5	72.00
-Irrigation	13.5	Hour	4.5	60.75
HARVEST				
BURN & HARVEST	54	ton	5.88	317.52
Total HARVEST				317.52
Interest - OC Borrowed	328.79	Dol.	0.12	39.45
Total VARIABLE COST				953.82

Break-Even Price, Total Variable Cost $17.66 per ton of sugar cane

GROSS INCOME minus VARIABLE COST 126.18

FIXED COST Description	Uri i t		Total
Machinery and Equipment	Acre		168.08
Land	Acre		70.00
Total FIXED Cost			238.08

Break-Even Price, Total Cost $22.07 per ton of sugar cane

Total of ALL Cost 1191.90

NET PROJECTED RETURNS -111.90

Projections for Planning Purposes Only B-1241(CI2)

RATOON CANE, IRRIGATED....ATRAZINE
South Texas District
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ Unit	Total
SUGAR CANE	45	ton	20	900.00
Total GROSS Income				900.00

VARIABLE COST Description	Quantity	Unit	$ Unit	Total
PREHARVEST				
ATRAZINE	2	appl	10.25	20.50
NITROGEN (DRY)	75	lb.	0.31	23.25
IRRIGATION	6	AcIn	1.333	8.00
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
IRRIGATION	18	AcIn	1.333	23.99
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
IRRIGATIDN	6	Acln	1.333	8.00
SCOUTING	1	acre	1.5	1.50
IRRIGATION	12	AcIn	1.333	16.00
NITROGEN (DRY)	75	lb.	0.31	23.25
IRRIGATION	6	AcIn	1.333	8.00
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
Fuel & Lube - Machinery		Acre		14.81
Repairs-Machinery		Acre		4.26
Labor-Machinery	6.368	Hour	5.00	31.84
-Irrigation	12	Hour	4.5	54.00
Total PREHARVEST				322.89
HARVEST				
BURN & HARVEST	45	ton	5.88	264.6
Total HARVEST				264.6
Interest - OC Borrowed	300.956	Dol.	0.12	36.11
Total VARIABLE COST				623.61

Break-Even Price, Total Variable Cost $ 13.86 per ton of sugar cane

GROSS INCOME minus VARIABLE COST 276.39

FIXED COST Description	Unit	Total
Machinery and Equipment	Acre	217.26
Land	Acre	70.00
Total FIXED Cost		287.26

Break-Even Price, Total Cost $20.24 per ton of sugar cane

Total of ALL Cost 910.87

NET PROJECTED RETURNS -10.87

RATOON CANE, IRRIGATED....AMETRYN
South Texas District
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ Unit	Total
SUGAR CANE	45	ton	20	900.00
Total GROSS Income				900.00

VARIABLE COST Description	Quantity	Unit	$ Unit	Total
PREHARVEST				
AMETRYN	2	appl	15.97	31.94
NITROGEN (DRY)	75	lb.	0.31	23.25
IRRIGATION	6	AcIn	1.333	8.00
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
IRRIGATION	18	AcIn	1.333	23.99
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
IRRIGATIDN	6	AcIn	1.333	8.00
SCOUTING	1	acre	1.5	1.50
IRRIGATION	12	AcIn	1.333	16.00
NITROGEN (DRY)	75	lb.	0.31	23.25
IRRIGATION	6	AcIn	1.333	8.00
INSECTICIDE	1	appl	25	25.00
INSECTICIDE APPL	1	appl	3.5	3.50
Fuel & Lube - Machinery		Acre		14.81
Repairs-Machinery		Acre		4.26
Labor-Machinery	6.368	Hour	5.00	31.84
-Irrigation	12	Hour	4.5	54.00
Total PREHARVEST				334.33
HARVEST				
BURN & HARVEST	45	ton	5.88	264.6
Total HARVEST				264.6
Interest - OC Borrowed	300.956	Dol.	0.12	36.11
Total VARIABLE COST				635.05

Break-Even Price, Total Variable Cost $ 14.11 per ton of sugar cane

GROSS INCOME minus VARIABLE COST 264.95

FIXED COST Description	Unit	Total
Machinery and Equipment	Acre	217.26
Land	Acre	70.00
Total FIXED Cost		287.26

Break-Even Price, Total Cost $20.50 per ton of sugar cane

Total of ALL Cost 922.31

NET PROJECTED RETURNS -22.31

COTTON, IRRIGATED, with DICROTOPHOS
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ / Unit	Total
COTTON LINT	750	lb.	$0.63	$472.50
COTTONSEED	0.608	ton	90.00	$54.68
DEFICIENCY PMT. COTTON	750	lb.	0.12	$90.00
Total GROSS Income			$0.75	$617.18

VARIABLE COST Description	Quantity	Unit	$ / Unit	Total
PREHARVEST				
HERBICIDE	1.0	acre	$12.95	$12.95
NITROGEN (DRY)	60.0	lb.	0.31	18.60
PHOSPHATE	60.0	lb.	0.29	17.40
SEED	18.0	lb.	0.60	10.80
INSECTICIDE				75.30
PESTICIDE APPL.	10.0	appl	3.00	30.00
IRRIGATION	18.0	acin	1.33	23.94
Fuel & Lube - Machinery	1.0	acre	12.76	12.76
Repairs - Machinery	1.0	acre	4.28	4.28
Labor - Machinery	3.9	hour	6.81	26.49
- Irrigation	4.5	hour	5.70	25.64325
Total PREHARVEST				$258.16
HARVEST				
DEFOLIANT	1.0	acre	5.50	$5.50
DEFOLIANT APPL	1.0	acre	3.50	3.50
GIN, BAG, TIES	1.562	bale	30.00	46.86
CUSTOM PICKING	750.0	lb.	0.12	90.00
Fuel & Lube - Machinery	1.0	acre	0.20	0.20
Repairs - Machinery	1.0	acre	0.06	0.06
Labor - Machinery	0.1	hour	5.00	0.52
- Other	1.0	hour	4.50	4.50
Total HARVEST				$151.13
Interest - OC Borrowed	120.8	dol.	0.12	14.50
Total VARIABLE COST				$423.79
GROSS INCOME minus VARIABLE COST				193.38

FIXED COST Description	Unit	Total
Machinery and Equipment	acre	$71.00
Land	acre	70.00
Total FIXED Cost		$141.00
Total of ALL Cost		$564.79
NET PROJECTED RETURNS PER ACRE		$52.38

COTTON, IRRIGATED, with ACEPHATE
South Texas District (12)
1991 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ / Unit	Total
COTTON LINT	750	lb.	$0.63	$472.50
COTTONSEED	0.608	ton	90.00	$54.68
DEFICIENCY PMT. COTTON	750	lb.	0.12	$90.00
Total GROSS Income			$0.75	$617.18

VARIABLE COST Description	Quantity	Unit	$ / Unit	Total
PREHARVEST				
HERBICIDE	1.0	acre	$12.95	$12.95
NITROGEN (DRY)	60.0	lb.	0.31	18.60
PHOSPHATE	60.0	lb.	0.29	17.40
SEED	18.0	lb.	0.60	10.80
INSECTICIDE				77.64
PESTICIDE APPL.	10.0	appl	3.00	30.00
IRRIGATION	18.0	acin	1.33	23.94
Fuel & Lube - Machinery	1.0	acre	12.76	12.76
Repairs - Machinery	1.0	acre	4.28	4.28
Labor - Machinery	3.9	hour	6.81	26.49
- Irrigation	4.5	hour	5.70	25.64325
Total PREHARVEST				$260.50
HARVEST				
DEFOLIANT	1.0	acre	5.50	$5.50
DEFOLIANT APPL	1.0	acre	3.50	3.50
GIN, BAG, TIES	1.562	bale	30.00	46.86
CUSTOM PICKING	750.0	lb.	0.12	90.00
Fuel & Lube - Machinery	1.0	acre	0.20	0.20
Repairs - Machinery	1.0	acre	0.06	0.06
Labor - Machinery	0.1	hour	5.00	0.52
- Other	1.0	hour	4.50	4.50
Total HARVEST				$151.13
Interest - OC Borrowed	121.5	dol.	0.12	14.58
Total VARIABLE COST				$426.21
GROSS INCOME minus VARIABLE COST				190.96

FIXED COST Description	Unit	Total
Machinery and Equipment	acre	$71.00
Land	acre	70.00
Total FIXED Cost		$141.00
Total of ALL Cost		$567.21
NET PROJECTED RETURNS PER ACRE		$49.96

COTTON, DRYLAND, with DICROTOPHOS
South Texas District (12)
1992 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ / Unit	Total
COTTON LINT	500	lb.	$0.63	$315.00
COTTONSEED	0.405	ton	90.00	36.45
DEFICIENCY PMT. COTTON	500	lb.	0.120	60.00
Total GROSS Income			$0.75	$411.45

VARIABLE COST Description	Quantity	Unit	$ / Unit	Total
PREHARVEST				
NITROGEN (DRY)	30.00	lb.	$0.31	$9.30
PHOSPHATE	30.0	lb.	0.29	8.70
SEED	18.0	lb.	0.60	10.80
HERBICIDE	1.0	acre	12.95	12.95
INSECTICIDE				30.12
PESTICIDE APPL.	4.0	acre	3.00	12.00
Fuel & Lube - Machinery	1.0	acre	12.25	12.25
Repairs - Machinery	1.0	acre	3.93	3.93
Labor - Machinery	3.6	hour	6.81	24.50
Total PREHARVEST				$124.55
HARVEST				
DEFOLIANT	1.0	acre	5.50	5.50
DEFOLIANT APPL	1.0	acre	3.50	3.50
GIN, BAG, TIES	1.041	bale	30.00	31.23
CUSTOM STRIPPING	500.0	lb.	0.08	40.00
Fuel & Lube - Machinery	1.0	acre	0.20	0.20
Repairs - Machinery	1.0	acre	0.06	0.06
Labor - Machinery	0.1	hour	5.00	0.52
- Other	1.0	hour	4.50	4.50
Total HARVEST				$85.51
Interest - OC Borrowed	84.44	dol.	0.12	10.13
Total VARIABLE COST				$220.18
GROSS INCOME minus VARIABLE COST				$191.27

FIXED COST Description	Unit	Total
Machinery and Equipment	acre	$64.45
Land	acre	40.00
Total FIXED Cost		$104.45
Total of ALL Cost		$324.63
NET PROJECTED RETURNS PER ACRE		$86.82

COTTON, DRYLAND, with ACEPHATE
South Texas District (12)
1992 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ / Unit	Total
COTTON LINT	500	lb.	$0.63	$315.00
COTTONSEED	0.405	ton	90.00	36.45
DEFICIENCY PMT. COTTON	500	lb.	0.120	60.00
Total GROSS Income			$0.75	$411.45

VARIABLE COST Description	Quantity	Unit	$ / Unit	Total
PREHARVEST				
NITROGEN (DRY)	30.00	lb.	$0.31	$9.30
PHOSPHATE	30.0	lb.	0.29	8.70
SEED	18.0	lb.	0.60	10.80
HERBICIDE	1.0	acre	12.95	12.95
INSECTICIDE				32.46
PESTICIDE APPL.	4.0	acre	3.00	12.00
Fuel & Lube - Machinery	1.0	acre	12.25	12.25
Repairs - Machinery	1.0	acre	3.93	3.93
Labor - Machinery	3.6	hour	6.81	24.50
Total PREHARVEST				$126.89
HARVEST				
DEFOLIANT	1.0	acre	5.50	5.50
DEFOLIANT APPL	1.0	acre	3.50	3.50
GIN, BAG, TIES	1.041	bale	30.00	31.23
CUSTOM STRIPPING	500.0	lb.	0.08	40.00
Fuel & Lube - Machinery	1.0	acre	0.20	0.20
Repairs - Machinery	1.0	acre	0.06	0.06
Labor - Machinery	0.1	hour	5.00	0.52
- Other	1.0	hour	4.50	4.50
Total HARVEST				$85.51
Interest - OC Borrowed	85.38	dol.	0.12	10.25
Total VARIABLE COST				$222.64
GROSS INCOME minus VARIABLE COST				$188.81

FIXED COST Description	Unit	Total
Machinery and Equipment	acre	$64.45
Land	acre	40.00
Total FIXED Cost		$104.45
Total of ALL Cost		$327.09
NET PROJECTED RETURNS PER ACRE		$84.36

GRAPEFRUIT , MATURE GROVE (145 TREES/ACRE) with ALDICARB
South Texas District (12)
1992 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ / Unit	Total	Your Estimate
GRAEFRUIT	22.00	ton	$135.00	$2,970.00	
Total GROSS Income				$2,970.00	

VARIABLE COST Description	Quantity	Unit	$ / Unit	Total	
PREHARVEST					
TREE INSURANCE	1.00	acre	$77.50	$77.50	
TREE HEDGING	1.00	acre	60.00	60.00	
NITROGEN	150.00	lb.	0.31	46.50	
FERTILIZER APPL	3.00	appl	3.00	9.00	
HERB.,SELECTIVE	10.00	qt.	3.60	36.00	
MITICIDE	4.00	qt.	8.28	33.12	
INSECTICIDE -Aldicarb	33.00	lb.	4.20	138.60	
INSECTICIDE APPL - Aldicarb	1.00	appl	1.50	1.50	
INSECTICIDE - Vendex 4L	3.00	qt.	40.00	120.00	
INSECTICIDE APPL	2.00	appl	20.00	40.00	
IRRIGATION	72.00	AcIn	0.67	47.95	
CONTACT HERB.	2.00	acre	17.50	35.00	
HERBICIDE APPL	2.00	appl	8.00	16.00	
FUNGICIDE	6.00	lb.	2.30	13.80	
Fuel & Lube - Machinery	1.00	acre	2.26	2.26	
Repairs - Machinery	1.00	acre	0.54	0.54	
Labor - Machinery	1.27	hour	6.81	8.63	
- Other	12.00	hour	5.70	68.38	
- Irrigation	9.00	hour	5.70	51.29	
Total PREHARVEST				$806.07	
Interest - OC Borrowed	506.21	dol.	0.12	60.75	
Total VARIABLE COST				866.82	

Break-Even Price - Total Variable Cost $39.40 per ton of GRAPEFRUIT

GROSS INCOME minus VARIABLE COST $2,103.18

FIXED COST Description	Unit	Total	
MISC ADMIN. 0/H CITRUS	Acre	$7.50	
Machinery and Equipment	Acre	53.04	
Land	Acre	70.00	
Perennial Crop	Acre	398.03	
Total FIXED Cost		$528.57	

Total of ALL Cost $1,395.39

NET PROJECTED RETURNS PER ACRE $1,574.61

Break-Even Price - Total Variable Cost $63.43 per ton of GRAPEFRUIT

GRAPEFRUIT , MATURE GROVE (145 TREES/ACRE) without ALDICARB
South Texas District (12)
1992 Projected Costs and Returns per Acre

GROSS INCOME Description	Quantity	Unit	$ / Unit	Total	Your Estimate
GRAEFRUIT	19.80	ton	$135.00	$2,673.00	
Total GROSS Income				$2,673.00	

VARIABLE COST Description	Quantity	Unit	$ / Unit	Total	
PREHARVEST					
TREE INSURANCE	1.00	acre	$77.50	$77.50	
TREE HEDGING	1.00	acre	60.00	60.00	
NITROGEN	150.00	lb.	0.31	46.50	
FERTILIZER APPL	3.00	appl	3.00	9.00	
HERB.,SELECTIVE	10.00	qt.	3.60	36.00	
MITICIDE	4.00	qt.	8.28	33.12	
INSECTICIDE - Vendex 4L	6.00	qt.	40.00	240.00	
INSECTICIDE APPL	4.00	appl	20.00	80.00	
IRRIGATION	72.00	AcIn	0.67	47.95	
CONTACT HERB.	2.00	acre	17.50	35.00	
HERBICIDE APPL	2.00	appl	8.00	16.00	
FUNGICIDE	6.00	lb.	2.30	13.80	
Fuel & Lube - Machinery	1.00	acre	2.26	2.26	
Repairs - Machinery	1.00	acre	0.54	0.54	
Labor - Machinery	1.27	hour	6.81	8.63	
- Other	12.00	hour	5.70	68.38	
- Irrigation	9.00	hour	5.70	51.29	
Total PREHARVEST				$825.97	
Interest - OC Borrowed	518.71	dol.	0.12	62.25	
Total VARIABLE COST				888.22	

Break-Even Price - Total Variable Cost $44.86 per ton of GRAPEFRUIT

GROSS INCOME minus VARIABLE COST $1,784.78

FIXED COST Description	Unit	Total	
MISC ADMIN. 0/H CITRUS	Acre	$7.50	
Machinery and Equipment	Acre	53.04	
Land	Acre	70.00	
Perennial Crop	Acre	398.03	
Total FIXED Cost		$528.57	

Total of ALL Cost $1,416.79

NET PROJECTED RETURNS PER ACRE $1,256.21

Break-Even Price - Total Variable Cost $71.55 per ton of GRAPEFRUIT