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A MARKETING PLAN

FOR

NORTH CAROLINA CORN GROWERS

T. Everett Nichols, Jr.
and
Rodrick A. Skewes

DEPARTMENT OF ECONOMICS AND BUSINESS
NORTH CAROLINA STATE UNIVERSITY
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Economics Information Report No. 74

A MARKETING PLAN FOR NORTH CAROLINA CORN PRODUCERS

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ABSTRACT

This publication describes an integrated corn marketing plan and provides worksheets for use in developing the plan. A marketing plan provides a systematic method for evaluating all marketing alternatives and choosing a strategy that helps you obtain the most profit from your crop.

The marketing plan consists of five sections, each covering a different aspect of the marketing decision process. First, a break-even price for corn production is developed. In the next two sections, marketing alternatives for the crop before harvest, while it is still in the field, and after harvest during storage, are evaluated, given current market conditions. Fourth, an income statement is developed that splits income between production and storage to provide an important overview of the profitability of the entire operation. Finally, a cash flow accounting section is included to ensure proper timing of inflows and outflows.

An additional aspect of this plan is that it is available as a computer spreadsheet. This provides the plan with increased speed and hence flexibility. After the current market situation has been inputted, new price information can be added as needed and the impact on all marketing alternatives can be evaluated in a matter of seconds.

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A MARKETING PLAN FOR NORTH CAROLINA CORN PRODUCERS

T. E. Nichols, Jr. and R. A. Skewes

Introduction

Farming is risky business. The two basic types of risks faced by farmers are price risk and yield risk. Farmers face price risk because they have only limited control over the prices they receive for their products and there is never any guarantee of receiving a profitable price. Yield risk is the chance that, even if the producer does everything he can, circumstances may work against him and reduce his yields to an unprofitable level. Weather is the biggest factor in yield risk although other factors such as pests and disease do enter in.

Throughout history farmers have concentrated on reducing yield risk. Land grant colleges and The Extension Service originally were established to reduce yield risk. With the widespread use of hybrid seed, fertilizer, herbicides, pesticides and irrigation, farmers have been quite successful in minimizing their variability.

Price risk, on the other hand, has been virtually ignored. Given the nature of agricultural markets, most people feel they have no control over the price they receive. Although this is true of a specific time in a specific market, it is not true generally. A producer has quite a bit of control over when and where he delivers his crop and at what time he prices his product. Marketing, or the process of analyzing all potential

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outlets for a product to get the best possible price, is the best way a farmer can reduce price risk. Like yield risk, however, price risk can never be completely eliminated.

This publication is designed to help producers reduce their price risk through the improvement of their marketing skills. To do this, the marketing process is divided into four different subprocesses and an income statement. First a breakeven analysis is used to determine the minimum price needed. This is an important first step because a producer needs to know his costs so he knows when the market is offering a profit. Second, a marketing alternatives analysis is provided so the producer can monitor a number of different marketing alternatives at any time during the production process. Third, a marketing alternatives analysis for the stored crop helps answer questions concerning the profitability of storage. An income statement is included so gross and net income from all sources can be compared to present net income on a per-bushel and per-acre basis. Finally, a cash flow analysis is made to aid the producer in optimizing the timing of his cash inflows and outflows.

Adding to the attractiveness of this plan is the fact that it is available as a computer spreadsheet, which greatly reduces computations and increases its usefulness. As a computer spreadsheet, any price can be changed to reflect changing market conditions or different possible outcomes, with new results calculated in a matter of seconds.

This marketing plan will not eliminate all risks. It will, however, reduce price risk as much as possible and give a good accounting of "where it all goes."

CORN PRODUCTION COSTS AND BREAKEVEN PRICE

Knowledge of production costs and breakeven price is important in the development of a good marketing plan. The breakeven price helps determine when to begin contracting a sales price for the crop. In most years, pricing and delivery decisions must be separated to obtain the most profit. Without knowledge of production costs and breakeven prices, producers cannot know when the market is offering a profit or loss. A simple procedure for figuring the breakeven price for corn is shown in Table 1. Information needed to complete this worksheet includes variable and fixed costs of production, land costs and expected yield per acre. Data can be obtained either from your farm records or from enterprise budgets available from County Extension Offices. Tables 1.1 and 1.2 show a corn enterprise budget for the Coastal Plains area.

A special note about the NCSU estimates. These figures are for an operator in the designated area who is using currently accepted production techniques; they are not just averages for all types of practices and production conditions. The biggest differences between your estimates and the NCSU estimates will be for machinery costs because the NCSU estimates are for new equipment held for only approximately half of its useful life. Therefore, your estimates of tractor and machinery expenses most probably will be lower than the NCSU estimates. This will also lower your operating capital expense estimate.

Table 1. CORN BREAKEVEN PRICE WORKSHEET

Line #	Item	NCSU Estimate Sub-totals	NCSU Estimate Totals	Your Estimate Sub-totals	Your Estimate Totals
1	Variable costs				
2	Lime	$ 8.99			
3	Seed corn	20.80			
4	0-0-60, dry bulk	17.32			
5	Dry fertilizer spreading	4.50			
6	30% liquid nitrogen	28.73			
7	Liquid fertilizer spreading	10.00			
8	Preemerge herbicide	14.14			
9	Insecticide and nematocide	9.70			
10	Other	-			
11		-			
12	Tractor fuel & lube	4.97			
13	Tractor repair cost	1.93			
14	Machinery fuel & lube	4.14			
15	Machinery repair cost	6.00			
16	Operating capital expense	8.21			
17	Labor	8.87			
18	Total Variable Costs	$148.30	$148.30		
19					
20	Fixed costs				
21	Tractor investment	$ 3.77			
22	Machinery investment	15.51			
23	Tractor dep., taxes, insur.	3.32			
24	Machinery dep., taxes, insur.	18.65			
25	Total Fixed Costs	$ 41.25	$ 41.25		
26					
27	Land costs	45.00	45.00		
28	Total Costs Per Acre		$234.55		
29					
30	Costs per bushel/breakeven prices				
31	Pessimistic (55 bu./acre)		$ 4.26		
32	Average (80 bu./acre)		2.93		
33	Optimistic (110 bu./acre)		2.13		

CORN BREAKEVEN PRICE WORKSHEET
DIRECTIONS AND EXPLANATIONS

Line #1 - **Variable Costs: A subdivision of total costs. These are costs that change as you change your level of production. This is an important subdivision because if you cannot recover these costs, you will be better off not producing.**

			Reference to Table 1.2
Line #2	**- NCSU estimate**	**.333 tons x $27/ton = $8.99**	**Line A2**
	Your estimate	_____ x _____ = _____	
Line #3	**- NCSU estimate**	**16 lbs. x $1.30/lb. = $20.80**	**Line A3**
	Your estimate	_____ x _____ = _____	
Line #4	- NCSU estimate	2.0 cwt. x $8.66/cwt. = $17.32	Line A4
	Your estimate	_____ x _____ = _____	
Line #5	- NCSU estimate	1 acre x $4.50/cwt. = $4.50	Line A5
	Your estimate	_____ x _____ = _____	
Line #6	- NCSU estimate	4.67 cwt. x $6.15/cwt. = $28.73	Line A6
	Your estimate	_____ x _____ = _____	
Line #7	- NCSU estimate	2 acres x $5.00/acre = $10.00	Line A7
	Your estimate	_____ x _____ = _____	
Line #8	- NCSU estimate	1 acre x $14.14/acre = $14.14	Line A8
	Your estimate	_____ x _____ = _____	

The NCSU estimate is comprised of 2 quarts Lasso and 1½ quarts Atrazine per acre.

Line #9	- NCSU estimate	1 acre x $9.70/acre = $9.70	Line A10
	Your estimate	_____ x _____ = _____	

The NCSU estimate is comprised of 6½ lbs. Furadan 15-G per acre.

Lines #10 & 11 - Other: Any other costs you incur as a result of growing this season's corn crop only. These may include irrigation or postemerge herbicide expenses. Do not include any costs you would incur even if you did not grow corn.

Line #12 - NCSU estimate $4.97 Reference line B11, Table 1.1
Your estimate _____

If you do not have a reasonable estimate of your tractor fuel and lube costs, a simple approach would be to take your total tractor fuel and lube costs times the proportion of your tractor time spent on corn divided by the number of acres of corn produced.

Total fuel and lube costs	x	% of tractor time used in corn	÷	# acres of corn produced	=	Average fuel & lube cost per acre of corn

Line #13 - NCSU estimate $1.93/acre Reference line B12, Table 1.1
Your estimate _____

Here again, if you do not have a reasonable estimate, you may figure it as in line #12.

Line #14 -	NCSU estimate	$4.14/acre	Reference line B13	Table 1.1
	Your estimate	_____		
Line #15 -	NCSU estimate	$6.00/acre	Reference line B14	Table 1.1
	Your estimate	_____		

Line #16 Note that the NCSU estimates for lines 12-15 were derived using the Oklahoma budget generator and are not explicitly presented in Tables 1.1 or 1.2. The necessary calculations are presented in the Appendix to this chapter.

Line #16 - NCSU estimate $8.21
Your estimate _____

This is an estimate of how much your production expenses cost or the opportunity cost of your money. The idea here is to realize that by putting your money into producing corn, you are giving up income that the money could generate elsewhere, say in a money market account. The method for deriving this estimate is as follows:

(1) Obtain the monthly interest charge for each expense by dividing the annual interest rate by 12. If you have paid for all inputs in cash, use the interest rate your money would earn at your bank.

(2) Multiply the monthly interest charge by the number of months until harvest (September) from the time of expenditure.

(3) Multiply the number obtained in (2) by the expenditure.

For example, the operating capital expense in March would be calculated as:

(1) $\frac{.13}{12} = .0108$

(2) .0108 x 6 mos. = .065

		Reference to Table 1.2
(3) Potash	$17.32	Line A4
Spreading	4.50	Line A5
Machinery expense	3.72	Lines F3 + F4; $1.40 + $2.32
Machinery labor	1.485	Line D1; .33 x $4.50
	$27.025 x .065 = $1.757	

Hence, each expense is assumed to be paid at the time the input is applied. The 13 percent annual rate is the return our money could be getting elsewhere. Similar calculations are done for each month and then added together to get our estimate of $8.21. The method used in Table 1.2 is different. There, a weighted average of each monthly expense is calculated by the number of months until harvest divided by 12 are added together and multiplied by an annual interest rate, here 13%. The weighted production inputs are shown in line C of Table 1.2, and the weighted labor expenses are shown on line D2. To get our estimate, (.695 x $4.50) + $60.00 = $63.13, ($63.13) x .13 = $8.21. Both methods provide the same result. However, for the average producer where each line of credit is assessed a different interest charge, the method presented above is perhaps superior.

Line #17 - NCSU estimate 1.97 hrs. x $4.50/hr. = $8.87/acre
Your estimate _____ x _____ = _____

This is an estimate of labor used in corn production only. If you provide the labor, or part of it, be sure to make a distinction between your labor time and your management time. Also, if you are providing the labor, your wage rate should be at least equal to your best off-farm wage opportunity--your opportunity cost.

Line #18 - NCSU estimate $148.30
Your estimate _____

This is the proportion of your costs directly attributable to this year's corn production. These costs could be avoided by not producing corn.

Line #20 - Fixed Costs: Another subdivision of total costs. These are costs associated with ownership of equipment that you will incur whether or not you produce anything with it this year.

Line #21 - NCSU estimate .13 x $28.985 = $3.77 Reference line D2, Table 1.1
Your estimate ___ x _____ = _____

This is your cost of financing your tractor--whether or not it is paid for. If you do not have a reasonable estimate, use the method developed in line #12.

(Current market value of tractors) x (% interest charge) = (Total investment cost of tractors)

Total investment cost of tractors x % of tractors used for corn ÷ # acres of corn produced = cost of tractor investment to corn

Line #22 - NCSU estimate .13 x $119.295 = $15.51 Reference line D3, Table 1.1
Your estimate ___ x _____ = _____

Calculations are the same as those for line #21.

Line #23 - NCSU estimate $3.32 Reference line F1, Table 1.1
Your estimate _____

Consult your records and use the percentage of tractor depreciation, taxes and insurance applicable to your corn production per acre.

Line #24 - NCSU estimate $18.65 Reference line F2, Table 1.1
Your estimate _____

Calculations are the same as those for line #23.

As was the case for lines 12-15, lines 21-24 were obtained with a budget generator and are not explicitly presented in Tables 1.1 or 1.2.

Line #25 NCSU estimate $41.25
Your estimate _____

This is the proportion of your costs that would have been incurred had you produced nothing this year.

Line #27 - NCSU estimate $45
Your estimate ___

This figure is your rental price or, if you own the land, the rental price you would have had to pay to rent equivalent land--your opportunity cost.

Line #28 - NCSU estimate $235.12
Your estimate _____

This is your average total cost per acre of producing corn this year.

Line #30 - Costs Per Bushel/Breakeven Price: Since corn is valued in bushels it is convenient to know your cost per bushel. These can be thought of as breakeven prices in the marketing process. To obtain this number, simply divide the total from line #28 by the number of bushels per acre. Because yields vary from year to year and from field to field, we have allowed space for various yields.
(Our estimates are presented as examples only; you should insert your own yield estimates.)

Line #31 - NCSU estimate $235.12 ÷ 55 = $4.27
Your estimate _____ ÷ ___ = _____

Line #32 - NCSU estimate $235.12 ÷ 80 = $2.94
Your estimate _____ ÷ ___ = _____

Line #33 - NCSU estimate $235.12 ÷ 110 = $2.14
Your estimate _____ ÷ ___ = _____

TABLE 1.1.

CORN (COASTAL PLAIN--NONBILLBUG AREAS): Estimated revenue, operating expenses, annual ownership costs and net revenue per acre

Category	Units	Price	Quantity	Value	Your Value
A. 1. Production:					
Corn	Bu.	$ 2.35[a]	110.000	$258.50	
2. Total Receipts				$258.50	
B. Operating Inputs:					
1. Lime applied	Tons	$27.00	0.333	$ 8.99	
2. Seed corn	Lbs.	1.30	16.000	20.80	
3. 0-0-60, bulk[b]	Cwt.	8.66	2.000	17.32	
4. Dry fertilizer spreading	Acre	4.50	1.000	4.50	
5. 30% nitrogen solution[b]	Cwt.	6.15	4.670	28.73	
6. Liquid fertilizer spr.	Acre	5.00	2.000	10.00	
7. Preemerge herbicide	Acre	14.14	1.000	14.14	
8. Postemerge herbicide	Acre	5.93	1.000	5.93	
9. Insect. & nematocide	Acre	9.70	1.000	9.70	
10.					
11. Tractor fuel & lube cost	Acre			4.97	
12. Tractor repair cost	Acre			1.93	
13. Machin. fuel & lube cost	Acre			4.14	
14. Mach. repair cost	Acre			6.00	
15. Total Operating Cost				$137.15	
C. Returns to land, labor, capital, machinery, overhead and management				$121.35	
D. Capital Cost:					
1. Annual operating capital		$ 0.13	59.999	$ 7.80	
2. Tractor investment		0.13	28.985	3.77	
3. Machinery investment		0.13	119.295	15.51	
4. Total Interest Charge				$ 27.08	
E. Returns to land, labor, machinery, overhead and management				$ 94.27	
F. Ownership Cost (depreciation, taxes, insurance):					
1. Tractor	Dol.			$ 3.32	
2. Machinery	Dol.			18.65	
3. Total Ownership Cost				$ 21.97	
G. Returns to land, labor, overhead and management				$ 72.30	
H. Labor Cost:					
1. Machinery labor	Hour	$ 4.50	1.970	$ 8.87	
2. Total Labor Cost				$ 8.87	
I. Returns to land, overhead and management				$ 63.43	

Prepared by J. R. Anderson, Jr., Crop Science Extension Specialist, and D. F. Neuman, Extension Economist.

[a]Based on $2.65 price, a 20% moisture content at harvest and a 2.5% price discount for each percent moisture over 15.5%.

[b]Fertilizer based upon a high phosphorus index according to North Carolina soil analysis.

TABLE 1.2 Operating Inputs for Corn, by Months

LINE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRODUCTION				NUMBER OF UNITS					
1 Corn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	110.00

LINE	OCT	NOV	DEC	PRICE	WEIGHT	UNIT CODE	ITEM CODE	TP	CN
PRODUCTION		NUMBER OF UNITS							
1 Corn	0.00	0.00	0.00	2.35	0.00	2.00	62.00	2.00	0.00

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
A 1 OPERATING INPUTS				RATE/UNIT					
2 Lime, applied	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 Seed corn	0.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00
4 0-0-60, bulk	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
5 Dry fert. spread	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
6 30% nit. solut.	0.00	0.00	0.00	2.75	1.92	0.00	0.00	0.00	0.00
7 Liq. pest. spread	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
8 Preemerge herb.	0.00	0.00	0.00	1.00	.00	0.00	0.00	0.00	0.00
9 Postemerge herb.	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
10 Insect. & nemat.	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

	OCT	NOV	DEC	PRICE	NUMBER	UNIT	ITEM	TP	CN
1 OPERATING INPUTS		RATE/UNIT			UNITS				
2 Lime, applied	0.33	0.00	0.00	27.00	0.00	3.00	229.00	3.00	0.00
3 Seed corn	0.00	0.00	0.00	1.30	0.00	12.00	171.00	3.00	0.00
4 0-0-60, bulk	0.00	0.00	0.00	8.66	0.00	16.00	228.00	3.00	0.00
5 Dry fert. spread	0.00	0.00	0.00	4.50	0.00	7.00	230.00	3.00	0.00
6 30% nit. solut.	0.00	0.00	0.00	6.15	0.00	16.00	226.00	3.00	0.00
7 Liq. fert. spread	0.00	0.00	0.00	5.00	0.00	7.00	231.00	3.00	0.00
8 Preemerge herb.	0.00	0.00	0.00	14.14	0.00	7.00	254.00	3.00	0.00
9 Postemerge herb.	0.00	0.00	0.00	5.93	0.00	7.00	256.00	3.00	0.00
10 Insect. & nemat.	0.00	0.00	0.00	9.70	0.00	7.00	236.00	3.00	0.00

TABLE 1.2 Operating Inputs for Corn, by Months (cont'd)

MONTHLY SUMMARY OF RECEIPTS AND EXPENSES

	CATEGORY	UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
B	1 Total receipts	acre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	258.50	0.00	0.00	0.00	258.50
	2 Total expenses	acre	0.00	0.00	25.54	67.24	22.74	0.00	0.00	0.00	8.94	12.65	0.00	0.00	137.15
	Returns to land, labor, capital, machinery, overhead, risk and management														121.35
C	ANNUAL CAPITAL	dol.	0.00	0.00	12.77	28.02	7.58	0.00	0.00	0.00	0.00	11.63	0.00	0.00	60.00

LABOR REQUIREMENTS BY MONTH

D	1 Machinery labor	hour	0.00	0.00	0.33	0.14	0.00	0.00	0.00	0.00	0.98	0.51	0.00	0.00	1.97
	2 Weighted average		0.00	0.00	.165	.06	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.695

MACHINERY FIXED AND VARIABLE COSTS PER HOUR

	MACHINE	CODE	DEPR	INSUR.	TAX	TOTAL FIXED	REPAIR	FUEL	LUB.	TOTAL VARIABLE	INT.	HR/TIME
E	1 Tractor (4)	4	2.48	0.20	0.15	2.82	1.64	3.80	0.57	6.00	3.20	1.00
	2 Tractor (9)	9	4.83	0.38	0.29	5.51	3.21	7.05	1.06	11.32	6.25	1.00
	3 Pickup truck	17	2.42	0.10	0.08	2.60	1.31	3.05	0.46	4.81	1.68	1.00
	4 Truck	18	4.73	0.24	0.19	5.17	5.31	3.14	0.47	8.92	3.85	1.00
	5 Corn/bean combine	21	37.19	2.13	1.66	40.98	7.83	5.42	0.81	14.07	34.61	0.32
	6 Tandem disc	41	7.71	0.46	0.38	8.56	1.98	0.00	0.00	1.98	7.45	0.10
	7 Ripper-bedder	33	2.93	0.17	0.15	3.25	0.74	0.00	0.00	0.74	2.82	0.18
	8 Planter w/row s	46	5.09	0.30	0.25	5.65	3.55	0.00	0.00	3.55	4.92	0.20
	9 Bush hog	92	1.15	0.07	0.06	1.27	0.42	0.00	0.00	0.42	1.08	0.33
	0 Tandem disc	41	7.71	0.46	0.38	8.56	1.98	0.00	0.00	1.98	7.45	0.10

	OPERATION	ITEM NO.	DATE	TIMES OVER	LABOR HOURS	MACHINE HOURS	FUEL, OIL, LUB., REPAIR PER ACRE	FIXED COSTS PER ACRE
F	1 Bush hog	4.92	Oct.	1.00	0.396	0.327	2.30	2.94
	2 Tandem disc	9.41	Oct.	1.00	0.117	0.097	1.40	2.81
	3 Tandem disc	9.41	Mar.	1.00	0.117	0.097	1.40	2.81
	4 Ripper-bedder	9.33	Mar.	1.00	0.213	0.176	2.32	3.35
	5 Planter w/row s	4.46	Apr.	0.10	0.024	0.020	0.20	0.34
	6 Pickup truck	17	Apr.	0.10	0.120	0.100	0.48	0.43
	7 Corn/bean combine	21	Sep.	1.00	0.382	0.318	4.48	24.07
	8 Truck	18	Sep.	0.50	0.600	0.500	4.46	4.51
	9 Total				1.970	1.636	17.05	41.25

Appendix to Chapter One

The components for calculating individual machinery expenses are presented in Section E of Table 1.2. The calculations of the per acre cost estimates, as presented in Table 1.1, from the per hour cost estimates, Section E Table 1.2, are:

Tractor fuel and lube = (Hours/time of pulled machinery) x (Tractor fuel and lube/hr) x 1.1

Tractor repairs = (Hours/time of pulled machine) x (Tractor repair cost/hr) x 1.1

Machine fuel and lube = (Hours/time of pulled machine) x (Machine fuel and lube/hr)

Machine repair = (Hours/time of pulled machine) x (Machine repair/hr)

Example - Fuel and lube expense for line E5, combine.

Machine fuel and lube expense = .32 x (5.42 + .81) = $1.99

PRE-HARVEST MARKETING ALTERNATIVES ANALYSIS WORKSHEET

Instructions

This part of the marketing package is designed to help you analyze your potential marketing alternatives. The breakeven analysis has indicated what price is needed to make the crop profitable; this section will tell you what price the market is offering.

The first section is a basic profile of your current marketing environment. It includes prices now being offered or those that might be expected at a later date. It is careful comparison of your needs with the market offerings that is the cornerstone of successful marketing.

The next two sections will help you determine prices that can be expected from hedging in the futures market or buying a put option. These prices are not easily derived, but the process used here is as straightforward as possible.

The final three sections are various comparisons of your marketing alternatives. First, there is a direct, net-price-per-bushel comparison of all five alternatives. Second, the relative profitability of selling in the cash market, the most risky alternative, is compared with the other four relatively safe marketing alternatives. Finally, and most important, is an analysis of the profitability of all five marketing alternatives over your breakeven costs. This section tells you, in dollars and in percentage terms, what return per bushel each alternative is offering you. The final decision on whether or not to use any of these alternatives ultimately will come from this section.

The examples presented are for the 1984 marketing year. Our estimate of expected prices at harvest are the actual prices at harvest because our analysis is being done after the fact. Also, since options were not traded in 1984, we are assuming a 7% premium cost. All other figures, futures prices, interest costs and brokerage fees are the same as those faced at the time of the original transaction. Table 2 shows the preharvest marketing alternative analysis worksheet. A line-by-line explanation of how to use the worksheet follows the table.

C2.1

TABLE 2.

PRE-HARVEST MARKETING ALTERNATIVES ANALYSIS

Date_____

	Item	NCSU Estimate	Your Estimate
1.	Government Loan	3.01	_____
2.	Expected Cash Price at Harvest	2.80	_____
3.	Current December Futures Price	2.945	_____
4.	Expected December Futures Price at Harvest	2.8025	_____
5.	December Put Option Strike Price	3.20	_____
6.	Put Premium	.21	_____
7.	Forward Cash Contract Price	2.83	_____
8.	Brokerage Fee	70.00	_____
9.	Margin Requirement	.07	_____
10.	Interest Rate	.13	_____
11.	Number of Acres Planted	100	_____
12.	Expected Yield per Acre	107	_____
	a. Beginning Moisture Content	.20	_____
	b. Ending Moisture Content	.1475	_____
13.	Expected Number of Bushels to Market	9,994	_____
14.	Number of Hedging Contracts 1 x 5,000	5,000	_____
15.	Number of Option Contracts 2 x 5,000	10,000	_____
16.	Number of Months Until Harvest	10	_____
17.	Variable Costs 148.30 ÷ 99.94	1.48	_____
18.	Breakeven Costs 234.55 ÷ 99.94	2.35	_____
19.	Asking Price 2.35 x 1.2	2.82	_____

C2.2

	Hedge	NCSU Estimate	Your Estimate
20.	Expected Cash Price at Harvest	2.80	_____
21.	Expected Profit (Loss) from Hedge	.1425	_____
22.	Expected Cost of Hedge	.04	_____
23.	Expected Net Price per Bushel from Hedge	2.9025	_____

Pre-harvest Marketing Alternatives Analysis Worksheet C2.2 (cont'd)

	Option	NCSU Estimate	Your Estimate
24.	Buy December Put	.248	_____
25.	Expected Cash Price at Harvest	2.80	_____
26.	Expected Profit (Loss) from Option	.3975	_____
27.	Expected Final Brokerage Fee	.014	_____
28.	Expected Gross Price per Bushel from Option	3.1835	_____
29.	Expected Net Price per Bushel from Option	2.9355	_____

	Expected Net Price per Bushel	NCSU Estimate	Your Estimate
30.	Cash	2.80	_____
31.	Hedge	2.9025	_____
32.	Option	2.9355	_____
33.	Forward Cash Contract	2.83	_____
34.	Government Loan	3.01	_____

	Expected Returns over Cash of:	NCSU Estimate		Your Estimate	
35.	Hedge	$.1025	3.7%	_____	_____
36.	Option	$.1355	4.8%	_____	_____
37.	Forward Cash Contract	$.03	1.1%	_____	_____
38.	Government Loan	$.21	7.5%	_____	_____

	Expected Returns over Break-even	NCSU Estimate		Your Estimate	
39.	Cash	$.45	19.15%	_____	_____
40.	Hedge	$.5525	23.5%	_____	_____
41.	Option	$.5855	24.9%	_____	_____
42.	Forward Cash Contract	$.48	20.4%	_____	_____
43.	Government Loan	$.66	28.1%	_____	_____

Instructions for Worksheet

Instruction

Line #1 Government Loan - This is the minimum net price per bushel realized by participating in the government support program - the applicable loan rate plus the initial deficiency payment. In 1984 the loan rate for North Carolina was $2.80 and, with a projected deficiency payment of $.43, an initial deficiency payment of $.21 yields $3.01 per bushel. This is assuming you can store all your corn on the farm. If you must use commercial storage, you will have to pre-pay your storage costs, hence lowering your net receipt. To do this, divide your total pre-paid storage charge by the number of bushels placed in storage and subtract that from the number used above. This will give you the actual realized price from participation in the government loan program.

#2 Expected Cash Price at Harvest - This is your best guess as to what the cash market will be offering at harvesttime. There are a number of available sources to help you with this estimate, including outlook information, local elevator managers or local county Extension agents.

#3 Current December Futures Price - On January 13, 1984, a futures contract to deliver 5,000 bushels of #2 yellow corn was $2.945/bushel at the close of trading. There are a number of different sources for this information, including most newspapers, The Wall Street Journal or your personal broker. In this analysis, however, you need to use the price in effect when you actually place the hedge (sell the futures contract). The price quoted in newspapers will be close but not exact.

#4 Expected December Futures Price at Harvest - This is the price you expect to pay to offset your hedge. As is the case for expected cash price at harvest, this price reflects your attitude about the market at harvesttime. There are a number of sources of information to help you with this estimate, including outlook information, local county Extension agents or your personal broker.

#5 December Put Option Strike Price - A put option gives you the right, but not the obligation, to sell a futures contract at a specified price until some specified date; the expiration date. This fixed price is called the strike price. Here the put option gives you the right to sell a futures contract for $3.20/bushel.

#6 Put Premium - Premium is the cost of the option to the purchaser. It is the nonrefundable purchase price of the right to sell a futures contract for a designated strike price. Strike prices and premiums are available in major newspapers such as The Wall Street Journal or from your broker. Here, the right to sell a futures contract for $3.20 costs $.21.

Line #7 Forward Cash Contract Price - A forward contract is a cash market transaction in which a producer (you) and a purchaser (usually the local elevator) agree to the sale and purchase of a fixed quantity of grain to be delivered to the purchaser at some future time to a specified place. This figure may be obtained from your local elevator, other possible purchasers or your local Extension agent. In January of 1984, forward cash contracts were ranging between $2.74 and $2.92. Our figure is just a simple average.

#8 Brokerage Fee - A fee charged by a broker for the execution of a futures market transaction. This fee should cover complete hedging and/or option transactions. Commission fees are negotiable, so check with your broker to determine the cost of his services before placing your order. Here our $70 estimate is for one round-turn for a futures contract or half of a complete, one-contract option transaction. (Making the total brokerage fee on our options $140.00).

#9 Margin Requirement - An amount of money deposited by both the buyers and sellers of futures contracts with their brokers to ensure performance of the terms of the contract. Margin in commodities is not a payment of equity or down payment on the commodity itself but rather a performance bond or security deposit. The amount of the initial margin varies according to the price of the contract. Initial margin requirements can be obtained from your broker. Here we are assuming a 7 percent requirement.

#10 Interest Rate - This is the opportunity cost of your money as in the breakeven analysis.

#11 Number of Acres Planted - The total number of acres from which you expect to harvest corn. Here, we are expecting to harvest 100 acres.

#12 Expected Yield per Acre - This is the total number of wet bushels of corn you expect to average over all your acres harvested. We expect to yield 107 wet bushels per acre.

12a. Beginning Moisture Content - This is the moisture content at harvest when you first take the corn out of the field. We are expecting our corn to have approximately 20% moisture.

12b. Ending Moisture Content - No matter where your corn is headed, someone will have to dry your corn to some pre-determined level of moisture. To sell corn in the cash market, the standard moisture content for No. 2 corn is 15.5%. However, if you are planning to place your corn in storage, a moisture content of 14% is advised. If you're planning to send your corn through both channels, a weighted average of the two moisture contents should be used. Drying 20% of your crop to 14% and 80% to 15.5% is like drying the entire crop to 15.2%. Specifically, (.2)(.14) + (.8)(.155) = .152 or 15.2%. Here, we are planning to sell half of our crop and store half of our crop. More specifically, (.5)(.14) + (.5)(.155) = .1475 or 14.75%.

Line #13 Expected Number of Bushels to Market - After adjusting for shrinkage due to moisture loss, this is the actual physical amount of corn you expect to market this year. This is simply line #11 multiplied by line #12 adjusted for shrinkage. The adjustment for shrinkage factor is determined as:

$$\text{Shrinkage} = \left(1.0 - \frac{(1.0 - \text{Beginning Mositure})}{(1.0 - \text{Ending Moisture})}\right) + .005$$

Shrinkage Adjustment Factor = (1.0 - Shrinkage)

Here, since we are assuming .20 beginning moisture content and .1475 ending moisture content and .005 dry matter loss, we get

$$\text{Shrinkage} = \left(1.0 - \frac{(1.0 - .2)}{(1.0 - .1475)}\right) + .005 = .066$$

Shrinkage Adjustment Factor = (1.0 - .066) = .934

Adjusted Yield = Wet Yield x SAF = 107 x .934 = 99.938 bu.

Expected No. of Bushels to Market = AY x # acres = 99.938 x 100 = 9,994

#14-15 Number of Contracts - Commodity futures contracts for corn are sold in increments of 5,000 bushels on the Chicago Board of Trade and 1,000 bushels on the MidAmerica Commodity Exchange. It is important to trade the correct number of contracts because, while you may purchase options for your entire crop, it is inadvisable to hedge more than 50-60 percent. Here, since we are assuming production of 10,000 bushels and trading on the Chicago Board of Trade, use only one contract for hedging and at most two for options.

#16 Number of Months until Harvest - This is the number of months your margin will be on deposit with your broker if you trade in the futures market. It is used to determine interest lost on that deposit because margin does not earn any interest.

#17-18 Variable and Breakeven Costs - These costs come directly from your breakeven analysis worksheet. Since that sheet was computed on a per-acre basis, we divide by the expected yield per acre adjusted for shrinkage to get an estimate of the costs per bushel. Here we are assuming 107 bushels per acre with an initial moisture content of 20 percent and a corresponding 6.6 percent shrinkage loss. This gives us a net yield per acre of 99.938 bushels.

#19 Asking Price - This is the price we would like to get for the crop. It covers all production costs and includes a return to risk and management. Here we have chosen a 20 percent return over breakeven costs.

#20 Expected Cash Price at Harvest - Same as line #2.

#21 Expected Profit or Loss from Hedge - This is your gross return from hedging; the pure gain or loss from price movements.

	NCSU Estimate	Your Estimate
Sell Dec. futures contract now	+2.945	+ _____
Buy Dec. futures contract at harvest	-2.8025	- _____
Profit (loss) from hedge	+ .1425	

#22 Expected Cost of Hedge - This cost includes the brokerage fee and interest lost on your margin deposit. Interest lost is computed as: (Total value of contract x % margin requirement) = margin. Margin x monthly interest rate x number of months until hedge is lifted = interest lost.

	NCSU Estimate	Your Estimate
Interest lost (2.945 x 5,000 x .07 $\frac{.13}{12}$ x 10 =	$111.66	
Brokerage fee	70.00	_____
Total cost of hedge	$181.66	
Per-bushel cost of hedge (181.66 ÷ 5,000)	$ .04	

#23 Expected Net Price per Bushel of Hedged Corn - This is the price you expect to realize on every bushel of hedged corn after accounting for all costs. The estimated expected net price per bushel, using our price projections in January (as presented in Table C2.1), is

	NCSU Estimate	Your Estimate
Expected Cash Price at Harvest	2.80	_____
Expected Profit (loss) for Hedge	+ .1425	_____
Expected Cost of Hedge	- .04	_____
Expected Net Price per Bushel	2.9025	_____

#24 Buy December Put - If you buy an option, whether or not you exercise it, you are sure to incur three costs; the initial brokerage fee, the premium, and the interest lost on these two expenses. Here, with an initial brokerage fee of $70 per contract, an interest rate of 13% and purchasing two contracts which we will hold for 10 months, we have a nonrefundable cost of:

	NCSU Estimate	Your Estimate
Initial brokerage fee	$70 x 2 = 140	_____
Premium	.21 x 10,000 = 2100	_____
Interest lost $(140 + 2100) \times \frac{.13}{12} \times 10$	= 242.67	_____
Total purchase cost	$2482.67	
Total per bushel cost (2482.67 ÷ 10,000)	$.248	

If an option is purchased, then this is entered onto our Cumulative Marketing Statement as negative income. It should be noted that this is a marketing cost and not a production cost.

#25 Expected Cash Price at Harvest - Same as line #2

#26 Profit (Loss) from Option - This is your gross return from exercising your option as a result of price movements.

	NCSU Estimate	Your Estimate
Buy December futures at harvest	$-2.8025	-
Sell December futures	+3.20	+ _____
Profit from exercising option	$ .3975	

#27 Final Brokerage Fee - When you exercise your option, you must pay additional brokerage fees for the purchase and sale of the futures contracts. Here $140 ÷ 10,000 = $.014

#28 Gross Price per Bushel from Option - This is the price per bushel of optioned corn you expect to realize without considering the cost of purchasing the option. Because we have already accounted for the purchase price, this becomes a relevant sales price when we enter this transaction onto the Cumulative Marketing Statement-Production.

	NCSU Estimate	Your Estimate
Cash price	$2.80	
Profit (loss) from option	+ .3975	
Final brokerage fee	- .014	
	$3.1835	

#29 Net Price per Bushel from Option - This is the actual price you will realize on the 5,000 bushels underlying the option if you exercise it. This price includes all relevant costs.

	NCSU Estimate	Your Estimate
Gross price per bushel	$3.1835	
	-.248	- _____
	$2.9355	

#30 Expected Cash Price at Harvest - Same as line #2

#31 Hedge - Same as line #23

#32 Option - Same as line #29

#33 Forward Cash Contract - Same as line #7

#34 Government Loan - Same as line #1

#35 Hedge -

	NCSU Estimate	Your Estimate
Line #31	$2.9025	
Line #30	-2.80	- _____
Cents per bushel	.1025	
Line #30	÷2.80	÷ _____
% (x100)	3.6%	%

#36 Option -

	NCSU Estimate	Your Estimate
Line #32	$2.9355	
Line #30	-2.80	- _____
Cents per bushel	.1355	
Line #30	÷2.80	÷ _____
% (x100)	4.8%	%

#37 Forward Cash Contract -

	NCSU Estimate	Your Estimate
Line #33	$2.83	
Line #30	-2.80	- _____
Cents per bushel	.03	
Line #30	÷2.80	÷ _____
% (x100)	1.0%	%

#38 Government Loan -

	NCSU Estimate	Your Estimate
Line #34	$3.01	
Line #30	-2.80	- _____
Cents per bushel	.21	
Line #30	÷2.80	÷ _____
% (x100)	7.5%	%

In this example, as is usually the case, blindly selling corn in the cash market at harvesttime is the worst marketing alternative.

#39 Cash -	NCSU Estimate	Your Estimate
Line #30	$2.80	
Line #18	-2.35	-
Cents per bushel	.45	
Line #18	÷2.35	÷
% (x100)	19.15%	%

#40 Hedge -	NCSU Estimate	Your Estimate
Line #31	$2.9025	
Line #18	-2.35	-
Cents per bushel	.5625	
Line #18	÷2.35	÷
% (x100)	23.5%	%

#41 Option -	NCSU Estimate	Your Estimate
Line #32	$2.9355	
Line #18	-2.35	-
Cents per bushel	.5955	
Line #18	÷2.35	÷
% (x100)	24.9%	%

#42 Forward Cash Contract -	NCSU Estimate	Your Estimate
Line #33	$2.83	
Line #18	-2.35	-
Cents per bushel	.49	
Line #18	÷2.35	÷
% (x100)	20.4%	%

#43 Government Loan -	NSCU Estimate	Your Estimate
Line #34	$3.01	
Line #18	-2.35	-
Cents per bushel	.67	
Line #18	÷2.35	÷
% (x100)	28.1%	%

Action Taken

With the information given in lines #39-43, we decide to purchase one option contract for 5,000 bushels and put the remaining 5,058 bushels into the government loan program. These transactions are entered on the Cumulative Marketing Statement-Production worksheet.

For participation in the government program, we are assuming base acreage of 111, with a base yield of 107 bushels per acre. With 10 percent set aside, or 11 acres, this gives a loan base of 10,700 bushels (before shrinkage). So, with an initial deficiency payment of $.21, we get a total initial deficiency payment of $2,247. This is entered on the Cumulative Marketing Statement-Production because it is a gain as a result of a marketing decision. This does not commit any bushels to any marketing activity, so the # bushels column is left blank.

At the end of January, our Cumulative Marketing Statement-Production is shown in Table 2.1. Before we have planted anything, we have an opportunity to market our entire crop with a more than 20 percent

Table 2.1 CUMULATIVE MARKETING STATEMENT-PRODUCTION

Date	Marketing Alternative	Price	# Bushels	Gross Income
January	Buy 1 December put Strike = 3.20	$-.248	5,000	$-1,240.00
January	Participate in government program	$ .21	____	$ 2,247.00
	Total (bu. sold and income)		5,000	$ 1,007.00
	Average price/bushel			$ .20

return. We have protected ourselves in two important ways. First, we are protected against price decreases on the entire crop while at the same time, in both instances, have not hindered our ability to take advantage of price increases. Second, by using an options instead of hedging or forward cash contracting, we have no obligation to produce anything.

In October we find that our calculations for production and the option transactions were correct, and we exercise our December put. We enter this transaction on the Cumulative Marketing Statement with the gross price per bushel as explained on line #28. This is shown as the third entry in Table 2.2 The 5,000 bushels are not entered here because they have already been accounted for when we originally bought the option. However, if we had not exercised our option, we would have needed to make an entry to reduce the number of bushels committed by 5,000. Also at harvest, we decide not to sell any corn in the cash market but to store the remaining 4,994 bushels under the government loan program.

The corn not marketed at harvest is "sold" to our storage enterprise at the government loan rate for two reasons. First, this allows for the correct accounting of the profitability of producing and marketing corn up to harvesttime. Second, the loan rate plus interest is the target price, or breakeven cost in a given month of that corn and allows for the correct accounting of the profitability of storing and marketing the corn after harvest. We now turn to the task of evaluating our marketing alternatives for the storage enterprise.

Table 2.2 CUMULATIVE MARKETING STATEMENT - PRODUCTION

Date	Marketing Alternative	Price	# Bushels	Gross Income
January	Buy 1 December put Strike = 3.20	$-.248	5,000	$-1,240.00
January	Participation in government program	$ .21		$ 2,247.00
October	Exercise put	$3.1815		$15,907.50
October	Government storage	$2.80	4,994	$13,983.20
	Total (bu. sold and income)		9,994	$30,897.70
	Average Price/bushel			$ 3.09

POST-HARVEST MARKETING ALTERNATIVES ANALYSIS WORKSHEET

Explanation

This is the final step in our marketing analysis. As in the pre-harvest marketing analysis, this section will help you analyze different marketing alternatives - this time for stored corn. With a stored crop, however, you have much greater flexibility as to selling time and a much better idea of the costs incurred before that sale.

We have split the farming operation into two distinct units (profit centers) for two very important reasons: 1) to keep track of which operation is making money, and 2) if both are profitable, to ascertain which is least (most) profitable. When costs and returns are properly accounted for, a storage enterprise that is actually losing money will no longer be overshadowed by a highly profitable production enterprise or vice versa. Even though the entire farm may be making a profit, the losses in storage can be spotted and corrected, and profits will be increased.

The analysis in this section is very similar to that used for the production enterprise. There are some differences however because of the obvious differences between the two operations. Storage costs are more easily computed than production costs but change every month, and there is much more flexibility as to when the corn can be sold. Because of this flexibility no specific futures contracts will be referred to, so that the number of months in storage must be explicity addressed.

You should note that the worksheet (Table 3) has been divided into five sections. Section I is like the first part of the production analysis; it is a summary of your storage costs and market offerings. The upper half of Section I consists of figures that probably will not change this season, whereas the lower half contains figures that may change every day. Essentially the upper section is your costs and the lower half, the market offerings at the time of analysis. As in the pre-harvest analysis, sections II and III look at hedging and option transactions. Section IV is concerned with the Government Loan Program and helps determine what cash price is needed to pay off the government loan plus interest and other holding costs. Remember that the cumulative cost here is different from that of the rest of the stored corn because the interest cost will be different. Section V shows expected returns of the three marketing alternatives over costs at the time of sale. The cash line shows returns from selling in the cash market over cumulative storage costs at the time of the analysis, whereas the other two show returns from hedging and options over cumulative storage costs at the time of those transactions (some time in the future).

C3.1

TABLE 3. POST-HARVEST MARKETING ALTERNATIVES ANALYSIS WORKSHEET

Date October

Section I.	Item	NCSU Estimate	Your Estimate
1.	Market Price at Storage	2.80	
2.	Fixed Storage Costs per Month	.03	
3.	Annual Shrinkage	.02	
4.	Interest on Government Loan	.10	
5.	Opportunity Cost of Capital	.13	
6.	Brokerage Fee	70.00	
7.	Margin Requirement	.07	
8.	Government Loan Rate	2.80	
9.	Number of Bushels in Storage	4,994	
10.	Number of Bushels to Hedge or Option	5,000	
11.	Current Futures Price	2.89¼	
12.	Expected Futures Price When Hedge Is Lifted	2.74½	
13.	Basis when Hedge Is Lifted	+.04	
14.	Expected Cash Price When Hedge Is Lifted	3.13	
15.	Put Option Strike Price	3.00	
16.	Put Premium	.21	
17.	Current Cash Price	2.80	
18.	Number of Months until Hedge Or Option Carried Out	5	
19.	Number of Months in Storage	0	

C3.2

Section II.	Hedge	NCSU Estimate	Your Estimate
20.	Expected Cash Price When Hedge Is Lifted	3.13	
21.	Profit (Loss) from Hedge	.1475	
22.	Cost of Hedge	+.025	
23.	Net Price per Bushel From Hedge	3.2525	

Section III.	Option	NCSU Estimate	Your Estimate
24.	Buy Put	+.235	
25.	Cash Price When Option Is Exercised	3.13	
26.	Profit (Loss) from Option	.255	
27.	Final Brokerage Fee	+.014	
28.	Gross Price per Bushel from Option	3.371	
29.	Net Price per Bushel from Option	3.136	

Table 3. (continued)

C3.2(Cont'd)

MARKETING ALTERNATIVES ANALYSIS WORKSHEET

Section IV. Government Loan Program Summary	NCSU Estimate	Your Estimate
30. Number of Months in Storage	0	_____
31. Cumulative Cost	2.80	_____
32. Current Cash Price	2.80	_____
33. Net Profit	0	_____

Section V. Expected Net Returns from Marketing Alternatives after 0 Months

	NCSU Estimate		Your Estimate	
Alternative	¢/bu.	%	¢/bu.	%
34. Cash	0	-	_____	_____
35. Hedge	.1275	4.1%	_____	_____
36. Option	.011	.35%	_____	_____

Instructions

Line #1 Market Price at Storage - This is the opportunity cost of the corn in storage. If you had sold the corn at harvest, you would have this money to invest elsewhere. Also, this is the amount credited to the production enterprise for corn not marketed. That is because corn that is produced is either sold or fed. The production enterprise must essentially sell all corn produced by the time it is harvested. If no other marketing alternatives were used, then that enterprise must sell in the cash market even if it is to the storage or feeding enterprise.

#2 Fixed Storage Costs - This is the cost per bushel it costs you to store your grain. It includes insurance, depreciation on bins, labor for handling and electricity for fans, etc. NCSU has estimated this cost to be approximately $.03 per bushel per month.

#3 Annual Shrinkage - When corn is stored, it loses moisture and other small trash (foreign matter) mixed in at the time of harvest. In the process of moving the corn into and out of storage and moving air through it while in the bins, NCSU has estimated that the corn will shrink 2 percent per year.

#4 Interest on Government Loan - The interest rate that the government charges on its loan. This is used in computing what is owed on the government loan so as to know when it is profitable to sell corn and pay off that loan.

#5 Opportunity Cost of Capital - This is the same rate as in production; the return you can get investing your money elsewhere, such as in a CD or elsewhere in your farming operation.

#6 Brokerage Fee - Here again, the same as for production. This should cover one roundturn for a hedge or half of a complete option transaction.

#7 Margin Requirement - An amount of money deposited by both the buyers and sellers of futures contracts with their brokers. As was pointed out in the production section, brokerage fees and margin requirements can be obtained from your broker. Here, we are assuming a 7 percent requirement.

#8 Government Loan Rate - This is the price per bushel that the government loaned you for the corn placed in storage under that program. This, along with the interest rate the government charges on that loan, is used to determine how much you owe the government at a given time. In our example, it is only coincidental that the government loan and the market price are equal.

#9 Number of Bushels in Storage - This is simply the number of bushels you currently have in storage uncommitted to any marketing activity Here (in October) we have 4,994 bushels in storage with none of them committed.

#10 Number of Bushels to Hedge or Option - Corn futures and options contracts are sold in increments of 5,000 bushels on the Chicago Board of Trade and 1,000 bushels on the MidAmerica Exchange. It is important not to sell too many contracts so you are not speculating

Line #10 (cont'd) with corn you do not have. A major difference between storage and production hedges is that with a storage hedge you can safely hedge the entire amount in storage. This allows you to hedge or sell an option on the same amount of corn. Here, we have 4,994 bushels in storage and are trading on the Chicago Board of Trade, so we would trade one contract, or 5,000 bushels.

#11 Current Futures Price - This is like the December futures price in the production analysis. The main difference here, however, is that there is no set time when the corn must be removed from storage so any futures price from this next December to next year's July may be used. Here we are using the price of a May 1985 contract on October 11, 1984.

#12 Expected Futures Price When Hedge is Lifted - The price of the futures contract used in line #11 expected when the hedge is lifted. (Remember, our estimate is the actual price of a May 1985 contract on March 14, 1985.)

#13 Basis When Hedge is Lifted - This is the difference between local cash prices and futures contract on the day the hedge is lifted. In this example, the difference between the Wilson cash price and the price of a May futures contract in March is expected to be $.04.

#14 Expected Cash Price When Hedge is Lifted - This is the price you expect the cash market to be offering when you lift your hedge or exercise your option and sell your corn out of storage.

#15 Put Option Strike Price - This is the price a put option gives you the right to receive for your corn. Here we have the right to sell 5,000 bushels of corn for $3.00/bushel.

#16 Put Premium - This is how much you must pay for the right to sell corn at a given strike price. Here we had to pay 21¢ per bushel for the right to sell that corn for $3.00. Strike prices and premiums from the previous day's trading are available in major newspapers such as The Wall Street Journal. Your broker, however, can provide you with up-to-the minute quotations.

#17 Current Cash Price - This is what the cash market is offering you at the time of this analysis. This is used in determining the profitability of selling your corn now both out of government storage and otherwise.

#18 Number of Months until Hedge or Option is Carried Out - This is the number of months your margin money or premium will not be earning interest.

#19 Number of Months in Storage - This is the number of months, up to the time of this analysis, your corn has been in storage. Here, because our example is October, 0 months have passed. This is used when computing the profitability of selling in the current cash market.

#20 Expected Cash Price When Hedge is Lifted - The same as line #14.

Line #21 Profit (Loss) from Hedge - This is your gross return from hedging; your gains or losses as a result of price movements only.

	NCSU Estimate	Your Estimate
Sell (May) futures now	+$2.8925	
Buy (May) futures in (March)	-2.745	-
Profit (loss) from hedge	.1475	

May and March are in parentheses because they could be any month during the storing season; these are simply the two we have chosen for our example.

#22 Cost of Hedge - This cost includes the brokerage fee and interest lost on your margin deposit. Interest lost is computed as follows:

(Price per bushel x number of bushels in contract x % margin requirement) = margin

Margin x cost of capital/12 x number of months until hedge is lifted = interest lost.

	NCSU Estimate	Your Estimate
Interest lost (2.8925 x 5,000 x .07) $\times \frac{.13}{12} \times 5 =$	$ 54.84	
Brokerage fee	70.00	
Total cost of hedge	$124.84	
Cost per bushel (124.84 ÷ 5,000)	.025	

#23 Net Price per Bushel from Hedge - This is the price you expect to realize on every bushel of hedged corn after accounting for all costs.

#24 Buy Put - When you buy a put option, there are three expenses that must be accounted for: the premium, interest lost and the brokerage fee. Here, with a premium of $.21 per bushel, an initial brokerage fee of $70, an interest rate of 13 percent, and five months until the option is to be exercised, our costs are computed as:

	NCSU Estimate	Your Estimate
Premium (5,000 x .21)	$1,050.00	
Brokerage fee	70.00	
Interest lost (.21 x 5,000) $\times \frac{.13}{12} \times 5$	56.875	
Total purchase price	$1,176.875	
Per bushel price (1,176.875 ÷ 5,000)	.235	

If an option is purchased, then this cost of $1,176.875 is entered on our Cumulative Marketing Statement-Storage as negative income. We do this to remind us that this is a marketing cost, not a storage cost.

Line #25 Cash Price When Option is Exercised - The same as line #13

#26 Profit (Loss) from Option - This is your gross returns from exercising your option as a result of price movements.

	NCSU Estimates	Your Estimate
Buy (May) futures in (March)	-$2.745	-
Exercise option and sell (May) futures	+ 3.00	+ _____
Profit (Loss) from Option	.255	

#27 Final Brokerage Fee - When you exercise your option, you must pay an additional brokerage fee for the purchase and sale of the futures contracts. Here $70 ÷ 5,000 = .014.

#28 Gross Price per Bushel from Option - This is the price per bushel we expect to realize without considering the purchase price of the option. This is the relevant price to enter on our Cumulative Marketing Statement-Storage because we have already accounted for the purchase price.

	NCSU Estimate	Your Estimate
Cash price	$3.13	
Profit (loss) from option	+ .255	
Final brokerage fee	- .014	- _____
Gross price per bushel	$3.371	

#29 Net Price per Bushel from Option - This is the actual price per bushel you expect to realize from buying and exercising the option described here. This includes all costs and is the relevant price when evaluating net returns.

	NCSU Estimate	Your Estimate
Gross price per bushel	$3.371	
Put purchase price	- .235	- _____
Net price per bushel	$3.136	

#30 Government Loan Situation Summary - This section is to remind you of the price per bushel you need to receive for corn placed under government loan. The cumulative cost, as calculated here, will be lower than the cumulative cost on the rest of the stored corn because the interest rate on the government loan is less than your cost of capital. The monthly costs here are computed as:

Monthly Storage Cost	NCSU Estimate	Your Estimate
Interest cost ($2.80 \times \frac{.10}{12}$)	$ .023	
Shrinkage cost ($2.80 \times \frac{.02}{12}$)	.005	
Fixed storage costs	.03	_____
Total monthly storage cost/bushel	$ .058	

Line #30 (cont'd) Profitability is computed as:

		NCSU Estimate	Your Estimate
	Government loan	$2.80	
#31	Monthly storage cost to date (.058 x 0)	+ 0	+ _____
	Cumulative cost/bushel	$2.80	
#32	Current cash price	-2.80	- _____
#33	Profit (loss) from storage	0	

#34 Cash - This is what the current cash market is offering you over all storage costs. Here, since this is the first month our corn has been in storage and the cash price is still the same as when we first placed it in storage, the cash market is offering us no gains. However, the calculations are :

Monthly Storage Cost	NCSU Estimate	Your Estimate
Interest cost (2.80 x $\frac{.13}{12}$)	$ .03	
Shrinkage cost (2.80 x $\frac{.02}{12}$)	.005	
Fixed costs	.03	_____
Total monthly storage cost/bu.	$ .065	

	NCSU Estimate	Your Estimate
Cash price	$2.80	
Cumulative storage costs (MSC x # months in storage) + (market price at storage time) = (.065 x 0) + 2.80	-2.80	- _____
$/bushel gain (loss)	0	
Cumulative storage costs	÷2.80	÷ _____
% return (x100)	0	%

#35 Hedge - This is telling you the returns available from hedging over the cumulative costs of storage at the time the hedge is lifted. Our cumulative storage costs are computed using the opportunity cost of capital and the number of months until the hedge is lifted.

	NCSU Estimate	Your Estimate
Net price per bushel from hedge	$3.2525	
Cumulative storage cost (2.80 + (.065 x 5)	-3.125	- _____
¢/bushel	.1275	
Cumulative storage cost	÷3.125	÷ _____
% (x100)	4.1%	%

Line #36 Option - This is telling you your expected return from buying and exercising an option over the cumulative storage costs at the time the option is exercised.

	NCSU Estimate	Your Estimate
Net price per bushel from option	$3.136	
Cumulative storage cost (see line #32)	-3.125	- _____
¢/bushel	.011	
Cumulative storage cost	÷3.125	÷ _____
% (x100)	.35%	_____ %

Action Taken

The postharvest marketing deciison chosen is shown in Table 3.1. Five thousand bushels of corn were stored and hedged in May futures. The contract was offset in early March and 4,994 bushels (106 bushels shrinkage) were sold in the cash market. The net selling price is the price of the futures contract less the cost of the hedge: $2.8925 - .025 = $2.8675. The offsetting transactions are as stated earlier.

TABLE 3.1 CUMULATIVE MARKETING STATEMENT-STORAGE

Date	Marketing Alternative	Price	# Bushels	Gross Income
October	Sell 1 May futures	$2.8675	5,000	$ 14,337.50
March	Buy 1 May futures	-2.745	-5,000	$-13,725.00
March	Sell 4,994 bu. cash	3.13	4,994	$ 15,631.22
	Total (bu. sold and income)		4,994	$ 16,243.72
	Average Price/bushel			$ 3.25

THE BOTTOM LINE

The main purpose of running a business such as a farm is to make profits, and the whole point of this marketing program is to increase your profits. The last section is an analysis of how profitable the corn enterprise of our hypothetical farm was in 1984.

Table 4 is an income statement for our corn production operation for the 1984-85 growing/marketing season. The income figures for both the production and storage phases come from their respective Cumulative Marketing Statements. Production costs were computed using the breakeven cost per acre, as shown on line #28 of the Corn Breakeven Analysis Worksheet, multiplied by the number of acres planted, as shown on line #11 of the Pre-Harvest Marketing Alternatives Analysis Worksheet; 235.12 x 100 = $23,512. The storage costs were computed using the costs per bushel per month, as used for lines #34-35, of the Post-Harvest Marketing Alternatives Worksheet, multiplied by the number of months in storage plus the number of months already in storage, and that is multiplied by the number of bushels in storage on line #9; .065 x (5 + 0) x 4,995 = $1,623.38. We must also subtract the principal repayment on our government loan ($14,162.40) because this is the value of the corn when it was placed in storage and is not income produced by the storage operation. We subtract only the principal here because the interest cost was included in the costs of storage.

In this example, the net income was $8,022.84, or $.8028 per bushel for 9,994 bushels. The net income per acre with a 107 wet bushel yield was $80.28.

Remember that this is not a cash flow statement. Your actual dollar income will be greater than this for two reasons. First, throughout this entire exercise we have been accounting for opportunity costs and depreciation, neither of which are cash costs. Second, when we computed the costs of storage, we used the opportunity cost of capital instead of the rate charged by the government. Therefore, this analysis does not account for the 3 percent extra earnings possible on the government loan.

TABLE 4. INCOME STATEMENT

Corn Marketing

1984-85 Growing/Marketing Season

Gross Income from Production	$30,897.70	
Less Costs of Production	23,512.00	
Net Income-Production		$7,385.70
Gross Income from Storage	$16,243.72	
Less Costs of Storage	1,623.38	
Less Principal on Government Loan	13,983.20	
Net Income-Storage		$ 637.14
Net Income		$8,022.84
Net Income per Bushel (8,201.38 ÷ 9,994)		$ .8028
Net Income per Acre (.8028 x 100)		$80.28

CUMULATIVE CASH FLOW AND MONTHLY CASH FLOW WORKSHEETS

Explanations and Directions

The worksheets in this section will help you track your cash sources and uses. This is an important part of your farm management because although the quantities of outflows and inflows are important, the timing of these flows is equally important. If you are raising 220 acres of corn, placing $33,000 cash in a noninterest-bearing checking account in March could cost you a bundle of money. For example, suppose you had your money in a money market account earning 10 percent interest per year. If you withdrew $33,000 to put into your checking account (at no interest) on March 1st, as opposed to withdrawing the funds only as needed, you would lose over $1,000 interest. Hopefully, these worksheets will enable you to plan your cash flows on a month-to-month basis so your cash expenses can be met with a minimum of lost interest or overdraft service charges.

At the end of the year, your cash expenses will equal or be very close to their estimates on your Breakeven Price Worksheet. If they are not, you need to check your figures, your original estimates or your understanding of the definitions of the entries.

By the nature of their creation, the North Carolina State University estimates will be different from yours. First, our estimates do not explicitly account for the cost of land, but treat it as having a claim on net income (like risk and management). Second, our hypothetical producer is able to do all

the labor himself, or at least does not pay any labor expenses. And finally, the machinery estimates were derived using a budget generator such that individual monthly estimates of the equipment expenses were unobtainable.

Our example here is the production of the 1984 corn crop. We have production cash flows for this crop over the 13-month period from October 1983 to October 1984. As you can see on the Cumulative Cash Flow (CCF) Statement, Table 5, we have allowed for an entry in each of these months even though there is no cash flow in some months.

Start with line #1 on the CCF Statement and decide on a beginning balance for your corn production enterprise. Here we have allotted $150 per acre, or $15,000, enough to cover variable costs without having to market anything before harvest. Depending on your personal situation with loan and land rental payments, you may want to allocate more. Remember, however, that these cash flows are only those that apply to your corn production. We suggest not allocating less than variable costs so you are not forced to market before harvest. This statement is designed to work exactly like a checkbook; net expenses lower the balance, and net income raises the balance. This is not your checking account balance, however. This statement is showing only your cash flows and should not necessarily reflect your noninterest-bearing account balance. The $15,000 beginning balance is the amount of money at our disposal for this growing season, not cash on hand. It could be a savings account, a money

market account, or even a line of credit from your bank; it is money that we know we will have available to spend.

In October 1983, we had cash expenses per acre of $1269 (Table 5.2). These figures are derived from Table 5.1 (which is exactly the same as Table 1.2). The $8.99 for line 2 comes from line A2, .333 x $27 = $8.99, and $3.70 for tractor and machinery expenses comes from the Fuel, Oil, Lube and Repair column on lines F1 and F2, $2.30 + $1.40 = $3.70. These are entered on the Monthly Cash Flow Statement for October 1983. Since we are producing 100 acres of corn, we have a net expense for October 1983 of $1,269.00, which is entered on the CCF Statement and the balance lowered accordingly. We had no cash flows for November or December 1983 (Tables 5.3 and 5.4).

In January we had a net income of $1,007. (Table 5.5) This is from decisions made in the marketing section of this package. We bought one December put option for $1,240, which is $12.40 per acre. Also, by participating in the government set-aside program, we received an initial deficiency payment of $2,247. Taken together, these become a $1,007 net income as shown on the Monthly Cash Flow Statement for January 1984. This is entered onto the CCF Statement as a net income for January, and the balance is raised. We had no cash expenses or incomes in February (Table 5.6).

In March we had expenses totaling $2,554 and no cash inflows (Table 5.7). The $17.32 expense for potash can be found on line A4 of Table 5.1 by multiplying the 2 in the "March"

TABLE 5. CUMULATIVE CASH FLOW, 1983-84

Line #	Month (Item)	NCSU Estimate			Your Estimate		
		Net Expense	Net Income	Balance	Net Expense	Net Income	Balance
1	Beginning Balance			$15,000.00			
2	October (1983)	$1,269.00		13,731.00			
3	November		--	13,731.00			
4	December		--	13,731.00			
5	January (1984)		$1,007.00	14,738.00			
6	February		--	14,738.00			
7	March	2,554.00		12,184.00			
8	April	6,723.00		5,461.00			
9	May	1,681.00		3,780.00			
10	June		--	3,780.00			
11	July		--	3,780.00			
12	August		--	3,780.00			
13	September	894.00		2,886.00			
14	October		29,890.70	32,776.70			
15	Ending Balance			32,776.70			

TABLE 5.1 Operating Inputs for Corn, by Months

LINE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
PRODUCTION				NUMBER OF UNITS					
1 Corn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	110.00

LINE	OCT	NOV	DEC	PRICE	WEIGHT	UNIT CODE	ITEM CODE	TP	CN
PRODUCTION		NUMBER OF UNITS							
1 Corn	0.00	0.00	0.00	2.35	0.00	2.00	62.00	2.00	0.00

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1 OPERATING INPUTS				RATE/UNIT					
2 Lime, applied	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 Seed corn	0.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00
4 0-0-60, bulk	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00
5 Dry fert. spread	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
6 30% nit. solut.	0.00	0.00	0.00	2.75	1.92	0.00	0.00	0.00	0.00
7 Liq. pest. spread	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
8 Preemerge herb.	0.00	0.00	0.00	1.00	.00	0.00	0.00	0.00	0.00
9 Postemerge herb.	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
10 Insect. & nemat.	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00

	OCT	NOV	DEC	PRICE	NUMBER UNITS	UNIT	ITEM	TP	CN
1 OPERATING INPUTS		RATE/UNIT							
2 Lime, applied	0.33	0.00	0.00	27.00	0.00	3.00	229.00	3.00	0.00
3 Seed corn	0.00	0.00	0.00	1.30	0.00	12.00	171.00	3.00	0.00
4 0-0-60, bulk	0.00	0.00	0.00	8.66	0.00	16.00	228.00	3.00	0.00
5 Dry fert. spread	0.00	0.00	0.00	4.50	0.00	7.00	230.00	3.00	0.00
6 30% nit. solut.	0.00	0.00	0.00	6.15	0.00	16.00	226.00	3.00	0.00
7 Liq. fert. spread	0.00	0.00	0.00	5.00	0.00	7.00	231.00	3.00	0.00
8 Preemerge herb.	0.00	0.00	0.00	14.14	0.00	7.00	254.00	3.00	0.00
9 Postemerge herb.	0.00	0.00	0.00	5.93	0.00	7.00	256.00	3.00	0.00
10 Insect. & nemat.	0.00	0.00	0.00	9.70	0.00	7.00	236.00	3.00	0.00

TABLE 5.1 Operating Inputs for Corn, by Months (cont'd)

MONTHLY SUMMARY OF RECEIPTS AND EXPENSES

	CATEGORY	UNIT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
B 1	Total receipts	acre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	258.50	0.00	0.00	0.00	258.50
2	Total expenses	acre	0.00	0.00	25.54	67.24	22.74	0.00	0.00	0.00	8.94	12.65	0.00	0.00	137.15
	Returns to land, labor, capital, machinery, overhead, risk and management														121.35
C	ANNUAL CAPITAL	dol.	0.00	0.00	12.77	28.02	7.58	0.00	0.00	0.00	0.00	11.63	0.00	0.00	60.00

LABOR REQUIREMENTS BY MONTH

D 1	Machinery labor	hour	0.00	0.00	0.33	0.14	0.00	0.00	0.00	0.00	0.98	0.51	0.00	0.00	1.97
2	Weighted average		0.00	0.00	.165	.06	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	.695

MACHINERY FIXED AND VARIABLE COSTS PER HOUR

	MACHINE	CODE	DEPR	INSUR.	TAX	TOTAL FIXED	REPAIR	FUEL	LUB.	TOTAL VARIABLE	INT.	HR/TIME
1	Tractor (4)	4	2.48	0.20	0.15	2.82	1.64	3.80	0.57	6.00	3.20	1.00
2	Tractor (9)	9	4.83	0.38	0.29	5.51	3.21	7.05	1.06	11.32	6.25	1.00
3	Pickup truck	17	2.42	0.10	0.08	2.60	1.31	3.05	0.46	4.81	1.68	1.00
4	Truck	18	4.73	0.24	0.19	5.17	5.31	3.14	0.47	8.92	3.85	1.00
5	Corn/bean combine	21	37.19	2.13	1.66	40.98	7.83	5.42	0.81	14.07	34.61	0.32
6	Tandem disc	41	7.71	0.46	0.38	8.56	1.98	0.00	0.00	1.98	7.45	0.10
7	Ripper-bedder	33	2.93	0.17	0.15	3.25	0.74	0.00	0.00	0.74	2.82	0.18
8	Planter w/row s	46	5.09	0.30	0.25	5.65	3.55	0.00	0.00	3.55	4.92	0.20
9	Bush hog	92	1.15	0.07	0.06	1.27	0.42	0.00	0.00	0.42	1.08	0.33
10	Tandem disc	41	7.71	0.46	0.38	8.56	1.98	0.00	0.00	1.98	7.45	0.10

	OPERATION	ITEM NO.	DATE	TIMES OVER	LABOR HOURS	MACHINE HOURS	FUEL, OIL, LUB., REPAIR PER ACRE	FIXED COSTS PER ACRE
1	Bush hog	4.92	Oct.	1.00	0.396	0.327	2.30	2.94
2	Tandem disc	9.41	Oct.	1.00	0.117	0.097	1.40	2.81
3	Tandem disc	9.41	Mar.	1.00	0.117	0.097	1.40	2.81
4	Ripper-bedder	9.33	Mar.	1.00	0.213	0.176	2.32	3.35
5	Planter w/row s	4.46	Apr.	0.10	0.024	0.020	0.20	0.34
6	Pickup truck	17	Apr.	0.10	0.120	0.100	0.48	0.43
7	Corn/bean combine	21	Sep.	1.00	0.382	0.318	4.48	24.07
8	Truck	18	Sep.	0.50	0.600	0.500	4.46	4.51
9	Total				1.970	1.636	17.05	41.25

TABLE 5.2 MONTHLY CASH FLOW WORKSHEET MONTH October 1983

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses:	$			
2	Lime	8.99			
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube)	3.70			
11	Tractor Repair)				
12	Machinery Fuel and Lube)				
13	Machinery Repair)				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other				
19	Total Expenses Per Acre	12.69			
20	x Number of Acres	100			
21	Total Expenses	$1,269.00	-$1,269.00		
22					
23	Income/Deposits		00		
24	Net Cash Flow		-$1,269.00		

TABLE 5.3 MONTHLY CASH FLOW WORKSHEET MONTH November 1983

Line #	Item	NCSU Estimate	Total	NCSU Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other				
19	Total Expenses Per Acre				
20	x Number of Acres				
21	Total Expenses				
22					
23	Income/Deposits				
24	Net Cash Flow		00.00		

TABLE 5.4 MONTHLY CASH FLOW WORKSHEET MONTH December 1983

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other	_____		_____	
19	Total Expenses Per Acre				
20	x Number of Acres	_____		_____	
21	Total Expenses				
22					
23	Income/Deposits		_____		_____
24	Net Cash Flow		00.00		_____

TABLE 5.5 MONTHLY CASH FLOW WORKSHEET MONTH January 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other	$12.40			
18	Other				
19	Total Expenses Per Acre	$12.40			
20	x Number of Acres	100			
21	Total Expenses	$1,240.00	-$1,240.00		
22					
23	Income/Deposits *		$2,247.00		
24	Net Cash Flow		+ $1,007.00		

*Initial Deficiency Payment from participation in government price support program. See marketing section.

TABLE 5.6 MONTHLY CASH FLOW WORKSHEET MONTH February 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other				
19	Total Expenses Per Acre				
20	x Number of Acres				
21	Total Expenses				
22					
23	Income/Deposits				
24	Net Cash Flow		00.00		

TABLE 5.7 MONTHLY CASH FLOW WORKSHEET MONTH March 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk	$ 17.32			
5	Dry Fertilizer Spreading	4.50			
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube)				
11	Tractor Repair)	3.72			
12	Machinery Fuel and Lube)				
13	Machinery Repair)				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other				
19	Total Expenses Per Acre	$ 25.54			
20	x Number of Acres	100			
21	Total Expenses	$2,554.00 -	$2,554.00		
22					
23	Income/Deposits		00.00		
24	Net Cash Flow		- $2,554.00		

column by the $8.66 in the "Price" column. Likewise the $4.50 expense for spreading potash can be found on line A5 of Table 5.1. The $3.72 equipment expense can be derived by adding the entries from lines F3 and F4 in the column labeled "Fuel, Oil, Lube and Repair." They are $1.40 and $2.32 for the $3.72 total. All of these total to make the $2,554 net expense, which is entered on the CCF Statement for March and the balance lowered.

In April we had expenses totaling $6,723 (Table 5.8). These include per-acre expenses of $20.80 for seed corn from line A3, Table 5.1, $16.91 for liquid nitrogen from line A6 (2.75 x $6.15), $5 for spreading the nitrogen from line A7, $14.14 for preemerge herbicide, line A8, and $9.70 for insecticide and nematocide found on line A10. The $.68 equipment expense is found on lines F5 and F6 in the column "Fuel, Oil, Lube and Repair." The $6,723 total is entered onto the CCF Statement and the balance lowered to $5,461.

In May we spread 1.92 cwt of 30 percent liquid nitrogen to complete the 4.67 cwt budgeted (Table 5.9). The $11.81 expense comes from Table 5.1, line A6, 1.92 x $6.15, and the $5 spreading expense comes from line A7. These total net expenses in May of $1,681, which is entered on the CCF Statement and the balance lowered accordingly. We had no cash expenses or incomes attributable to corn production in the months of June, July or August (Tables 5.10-5.12).

In September we had machinery expenses for harvesting the corn (Table 5.13). These can be seen on line F7 for the combine expense and line F8 for the truck expense in the column labeled

TABLE 5.8 MONTHLY CASH FLOW WORKSHEET MONTH April 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn	$ 20.80			
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen	16.91			
7	Liquid Fertilizer Spreading	5.00			
8	Preemerge Herbicide	14.14			
9	Insecticide and Nematocide	9.70			
10	Tractor Fuel and Lube)				
11	Tractor Repair)				
12	Machinery Fuel and Lube)	.68			
13	Machinery Repair)				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other				
19	Total Expenses Per Acre	$ 67.23			
20	x Number of Acres	100			
21	Total Expenses	$6,723.00	- $6,723.00		
22					
23	Income/Deposits		00.00		
24	Net Cash Flow		- $6,723.00		

TABLE 5.0 MONTHLY CASH FLOW WORKSHEET MONTH May 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen	$ 11.81			
7	Liquid Fertilizer Spreading	5.00			
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other				
19	Total Expenses Per Acre	$ 16.81			
20	x Number of Acres	100			
21	Total Expenses	$1,681.00	-$1,681.00		
22					
23	Income/Deposits		00.00		
24	Net Cash Flow		-$1,681.00		

TABLE 5.10 MONTHLY CASH FLOW WORKSHEET MONTH June 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other	_____		_____	
19	Total Expenses Per Acre				
20	x Number of Acres	_____		_____	
21	Total Expenses				
22					
23	Income/Deposits		_____		_____
24	Net Cash Flow		00.00		

TABLE 5.1 MONTHLY CASH FLOW WORKSHEET MONTH July 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other	_____		_____	
19	Total Expenses Per Acre				
20	x Number of Acres	_____		_____	
21	Total Expenses				
22					
23	Income/Deposits		_____		_____
24	Net Cash Flow		00.00		

TABLE 5.12 MONTHLY CASH FLOW WORKSHEET MONTH August 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other	_____		_____	
19	Total Expenses Per Acre				
20	x Number of Acres	_____		_____	
21	Total Expenses				
22					
23	Income/Deposits		_____		_____
24	Net Cash Flow		00.00		

TABLE 5.13 MONTHLY CASH FLOW WORKSHEET MONTH September 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube)				
11	Tractor Repair)				
12	Machinery Fuel and Lube)	$ 8.94			
13	Machinery Repair)				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other				
19	Total Expenses Per Acre	$ 8.94			
20	x Number of Acres	100			
21	Total Expenses	$894.00	-$894.00		
22					
23	Income/Deposits		00.00		
24	Net Cash Flow		-$894.00		

"Fuel, Oil, Lube and Repair." The total of the two entries $4.48 and $4.46 gives us our per-acre expense of $8.94, or $894 total. This is then entered onto the CCF Statement and the balance lowered to $2,886.00.

In October of 1984 we sold our corn (Table 5.14). As can be seen in the preharvest marketing section, when we exercised our put option, we realized $3.1815 per bushel for 5,000 bushels and placed the remaining 4,994 bushels in government storage at $2.80 per bushel. These combine for a total of $29,890.70. This is entered as a net income on the CCF Statement and the balance revised to our ending balance of $32,776.70. Note that the net income on the CCF Statement is the same as the gross income on the Cumulative Marketing Statement-Production (Table 2.2).

Table 5.14 MONTHLY CASH FLOW WORKSHEET MONTH October 1984

Line #	Item	NCSU Estimate	Total	Your Estimate	Total
1	Expenses				
2	Lime				
3	Seed Corn				
4	0-0-60, Dry Bulk				
5	Dry Fertilizer Spreading				
6	30% Liquid Nitrogen				
7	Liquid Fertilizer Spreading				
8	Preemerge Herbicide				
9	Insecticide and Nematocide				
10	Tractor Fuel and Lube				
11	Tractor Repair				
12	Machinery Fuel and Lube				
13	Machinery Repair				
14	Labor				
15	Loan Payments				
16	Land Rental				
17	Other				
18	Other	_____		_____	
19	Total Expenses per Acre				
20	x Number of Acres	_____		_____	
21	Total Expenses				
22					
23	Income/Deposits*		$29,890.70		_____
24	Net Cash Flow		+$29,890.70		_____

*Exercise put and realize $15,907.50 and sell into government storage and realize $13,983.20

COMPUTER INSTRUCTIONS

As an addition to this study, we have developed a computer program that greatly simplifies development of a marketing plan. With the computer program, all that is necessary is to input the necessary data; the computer will do the calculations for you. Obviously, this will be somewhat confusing and even tedious at first, but long-run time savings are potentially enormous.

We have attempted to keep the computer program as "user friendly" as possible. The computer spreadsheets resemble the worksheets as closely as possible so their use is virtually identical. The instructions given for the worksheets also apply to the computer input. Also, notice that the worksheets are numbered C1, C2.1, C2.2, etc. in the top right hand corner. These correspond to page numbers in the computer. spreadsheet. For example, the Preharvest Marketing Alternatives Analysis Worksheet is labeled C2.1, so its label on the computer spreadsheet is page 2_1. These page numbers will be used later in presenting specific instructions.

We have written this program using Multiplan, a commercially available software package that allows you to interact with the computer much more easily than does a standard language such as BASIC. We assume that since you are using this computer package, you have some degree of skill with Multiplan. We have tried to include some instructions we feel will make The Marketing Plan easier to use, but we will not go into the details of Multiplan.

To begin using this package, load Multiplan into your machine so you are looking at a blank spreadsheet with a couple of rows of commands at the bottom of the screen. Now place the CORNBEP disk in the B drive and load that into your spreadsheet. To do this, first type "T", for Transfer, "L" for load and then "b:CORNBEP" pressing the return key after each entry in quotations. After a few seconds, you will be looking at page C1 or the computer version of the Corn Breakeven Analysis Worksheet.

Before you are ready to really start working with this spreadsheet, there are two things you must do. First, because many of the numbers in this worksheet are calculated using other numbers in the worksheet, you will need to tell the computer not to recalculate all the other numbers every time you change one. To do this, while you are looking at the spreadsheet, press the letter "O" for options. Next, press the space bar so that the colored, rectangular cursor is over the word "NO" beside "Recalc:" and press the return key. You have now programmed the computer so that it will not recalculate the worksheet until you tell it to. Entering an exclamation point, "!", will tell the computer to recalculate.

Second, be sure you know how to move around the spreadsheet. The arrow keys on the lower right portion of your keyboard will move the cursor short distances in the direction of the arrow. For jumps, or long-range moves, the "GOTO" command is used. This is used for moving from page to page without

having to go through everything in between. To do this, while looking at the spreadsheet, type "G" for "GOTO". You then see a set of subcommands and should type "N" for name. At this point, type in the page where you want to go such as "page 5_14", with no spaces and an underline representing the decimal point. Figure 1 shows the entire Multiplan spreadsheet and the physical locations of all the CORNBEP worksheets. This can be a helpful guide if you get lost somewhere in the middle. Also, pressing the "HOME" key will send you back to the upper left corner of the spreadsheet, or to page C1. We now turn to some specific instructions for the use of CORNBEP.

Page C1, or the Corn Breakeven Analysis, is a simple budget of your production costs. You will notice two columns, "Estimates" and "Actual." The entries in the "Estimates" column are your estimates and can be inputted by you. The entries in the "Actual" column are the sum total of that production expense over the monthly cash flow statements and cannot be inputted by you on this page. Line 18 is the sum of the "Estimates" column variable costs. Therefore, since the "Actual" column is your actual values, for your Total Variable Cost estimate to be realistic, you should make your estimates equal their actual values. Line 25 is the sum of lines 20-24 and cannot be inputted, and line 28 is the sum of all lines and also cannot be inputted. Line 30 is your yield estimate, and line 31 is line 28 divided by line 30.

B/E C.1	CF 3/84 C.5.06	CF 9/84 C.5.12	CCF C.5.14	POST-HARVEST MKT.ALT. INPUT C.3.1	CUM. MKT. STA. PRO. C.2.3
CF 10/83 C.5.01	CF 4/84 C.5.07	CF 10/84 C.5.12		POST-HARVEST MKT.ALT. OUTPUT C.3.2	CUM. MKT. STAT.STOR. C.3.3
CF 11/83 C.5.02	CF 5/84 C.5.08	PRE-HARVEST MKT.ALT. INPUT C.2.1			INCOME STAT. C.4
CF 12/83 C.5.03	CF 6/84 C.5.09	PRE-HARVEST MKT.ALT. OUTPUT C.2.2			
CF 1/84 C.5.04	CF 7/84 C.5.10				
CF 2/84 C.5.05	CF 8/84 C.5.11				

FIG.1. Multiplan Spreadsheet for CORNBEP and Related Worksheets

Pages 5_01 through 5_13 are all similar and are all just like the Monthly Cash Flow statements in the cash flow section. You will notice that we have allowed an entry for almost all variable costs because it is these pages that are added to obtain the "Actual" column for page C1. You will input all entries except for Total Expenses and Net Cash Flow, which are calculated for you. Line 20, or Number of Acres, will be inputted by you on page 5_01 but not on any of the others. Once you have entered a number for line 20 on page 5_01, line 20 on pages 5_02 through 5_13 will have the same value. Enter all expenses as positive numbers; the computer will subtract them for you.

Page 5_14 is the Cumulative Cash Flow Statement. You need to input only the beginning balance; all other entries will be taken automatically from the monthly cash flow statements.

Page 2_1 will be inputted by you almost entirely using the instructions provided for the worksheet. You will not input line #13, however; it will be computed by the computer as explained in the instructions. Also, the last three lines will be figured for you using information you have already supplied the computer.

Page 2_2 requires no inputs by you at all. However, this is a very important page because the output provided here will be the basis for your marketing decisions.

Page 2_3 is a summary of your marketing decisions. You will need to input your decisions in columns 27, 28, 29 and 30; column 31 will be computed for you. In this case, <u>costs need to be inputted as negative numbers.</u> Because of the need elsewhere for

information on your government loan status, you need to input that information on line 5. If you are not using the government program, simply enter zeros for this row. Remember that the # Bushels column is for the number of bushels committed to a marketing strategy. Decisions like participation in the government loan program and buying a put option do not commit you to sell corn in those markets. For this reason, even though you have a per-bushel gain or expense that requires an entry in the # Bushels column (for the purpose of calculating column 31), you will have to subtract those bushels from the column as we have done for the government program and our put option. All entries for lines 24 and 25 will be computed for you.

Page 3_1, like page 2_1, is inputted entirely by you using the instructions provided for the worksheet. Pages 3_2, like page 2_2 requires no input but is very important because marketing decisions for your stored corn will depend on this information. Page 3_3 is done exactly like 2_3, inputting the first three columns and taking care that the # Bushels column total doesn't exceed the number of bushels you have stored.

Page 4, or your income statement, requires no inputs by you. All information is taken from previous sections of the spreadsheet, so you don't have to keep track of those figures. This is an important page because this is your income - what you actually made this year in your corn enterprise.

Finally, we would like to make some suggestions that will make using the computer a little easier. First, be sure that you

have set the worksheet so it will not recalculate until you tell it to. You will have to reset this everytime you reenter the worksheet, but it will be worth the extra time. Also, after you have inputted the necessary numbers and you have the spreadsheet on your screen, simply key in an exclamation point ("!") and the entire spreadsheet will be recalculated using the new numbers. Another suggestion is to use a spreadsheet cleared of all our data and save it under a new name so that the only numbers your actual spreadsheet can use will be your own. It is necessary to save your data under a different name so that you can return to CORNBEP from time to time for reference. (Saving it under the same name would write over the original CORNBEP.)

Once again, these instructions are for our program CORNBEP, not Multiplan. If you are having trouble getting started, consult your Multiplan manual or some qualified person. We feel you will find the spreadsheet quite easy to use with a minimal amount of effort.

Agricultural Research Service

North Carolina State University
at Raleigh

Director of Research