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FLOWS

**A Microcomputer Program for Projecting Annual Cash Flows,
Debt Repayment Ability and Proforma Financial Statements**

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Preface to this Edition

This manual explains version 2.1 of the FLOWS program. Version 2.1 is updated for use on LOTUS 123 version 2.01 rather than version 1A. The FLOWS menu structure has been expanded so that the entire program can be run from the menu. Thus, the program can be run with practically no knowledge of LOTUS 123. Several minor technical improvements have been made to the program to correct imperfections identified through user experience with versions 1.1 and 2.0.

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INTRODUCTION

Financial management of the farm business frequently requires projecting cash flows. The farm manager uses such projections to assess the viability of potential operating plans. Farmers and lenders use projected flows to determine repayment ability and assess financing alternatives.

The computer program described in this publication is designed to do the following:

1. Project operating cash flows for the coming year.
2. Project sustainable debt repayment ability and cash flows for an average future year.
3. Project cash flows and prepare a proforma (projected future) income statement and balance sheet for the coming year.

Historical data from the farm business are used as the base for projecting future cash flows. Thus, the management performance and technical coefficients for the actual farm business are automatically incorporated into the projected costs and returns¹. Changes in number of animals, crop mix and crop acres are reflected through pre-established or user entered relative cost coefficients, (i.e., fertilizer cost on oats relative to corn), while the absolute level is determined by the historical performance of the business being projected.

This model is designed to encourage high quality projections. Accounts payable are included to avoid projecting next years expenses based on the amount paid in cash instead of the amount actually incurred. Changes in inventories are included to keep unusual base year cash expense levels resulting from inventory buildup or depletion from biasing planned year cash flows. The fact that the base year could be abnormal in some respects can be corrected for by making entries in the "adjustments to base year" columns. Atypical occurrences that are expected to occur in the planned year are entered as "planned deviations." Further, these adjustments and deviations are not admonitions buried in the users manual; they are part of the program.

Quality is also built into the projection procedure through the emphasis placed on the largest dairy farm expense - feed. Apparent base year feed use is entered through input data on crop production, purchases, sales and inventory levels. That level of use is then the base for projecting planned year use. This procedure avoids projection problems

¹ For an example of the variation in production costs that occur, see LaDue, E.L. "Five Myths About Financing Dairy Farm Businesses". Cornell University Staff Paper No. 85-27.

caused by overestimation of yields, incomplete incorporation of inventory values and misestimation of rates of feed consumption.

The three alternative sets of projections that can be developed using the model are designed to assist farmer and other advisors in three specific situations.

Situation 1

When all that is desired is a projection of the cash income and expenses for the planned year, that can be accomplished by completing only Section 1 of the input form. This would be the case where: (1) the user has little interest, at least at this time, in a proforma income statement or balance sheet, (2) the level of debt payments will be analyzed external to the model, and/or (3) concern is with next year only, rather than the ability to make payments for more than one year into the future.

Situation 2

When a financing or refinancing plan is being evaluated so that the user is interested in the repayment ability of the business for an average future year, Sections 1 and 2 of the input should be completed. In this case the deviations, planned year relative prices and other planned year input should reflect the expected situation for an average future year. Sale of excess machinery and other one-time-only events should be excluded.

Situation 3

When the user is interested in the cash flow, ability to make planned year debt payments, net income and the solvency of the business at the end of the planned year Sections 1 and 3 of the input should be completed. The printout includes a comparison of net cash flow and planned debt payments, a proforma income statement for the planned year, proforma balance sheets for the beginning and end of the planned year and financial analysis ratios. In this case, the input data should pertain only to the planned year.

The complete capabilities of the model would be used in situations where a financing, refinancing or business adjustment plan has been developed. First, Sections 1 and 3 of the input form would be completed. Planned year data input would reflect the conditions for the coming year. The output from that analysis would indicate the cash flow and repayment situation specifically for the coming year and proforma balance sheet income statement data would be printed out reflecting the results of first year operation of the business under the new financing or operating plan. If within - year cash flow problems might occur or an analysis of monthly flows and repayment for the first year is deserved, a monthly cash flow plan should be developed². Following this analysis, the planned year data

² Monthly cash flow plans can be developed with a microcomputer using "A Monthly Cash Flow Planning Model for Dairy Farm Businesses" by LaDue and Cook (A.E. Res. 86-16) or by hand using "Monthly Cash Flow Planning" by Milligan, Smith and LaDue (A.E. Ext. 76-2).

in Section 1 would be adjusted to reflect conditions expected for the average future year and Section 2 would be completed. Output would then indicate whether the plan was financially feasible in the long run.

This publication is designed to assist users in using the microcomputer program for projecting annual cash flows, debt repayment ability and proforma financial statements. The first section specifies the technical characteristics of the model. This is followed by a section on instructions for input which explains the input data to be entered and provides a completed input form to illustrate proper entry. To the degree possible, the instructions and examples for a worksheet appear on the page facing, and in some cases the back of, the worksheet to facilitate use of the manual. The following section provides instructions on running the computer program. This includes information on how to load the program on the computer and on the commands used in running the model. The final section describes the output generated by the model and the logic used to calculate specific items.

Technical Characteristics of the Model

The microcomputer program for projecting annual cash flows, debt repayment ability and proforma financial statement (FLOWS) is a one diskette template for the LOTUS 123 spreadsheet. It requires an IBM or compatible microcomputer with 512k memory. It will print on IBM, Epson, Okidata or Hewlett Packard LaserJet printers. Some familiarity with LOTUS 123 will be to the user's advantage, but users should be able to run the model with no prior knowledge of LOTUS.

Description of Example Case

Clements Farm

Clyde Clements owns and operates a dairy farm in Central New York. The farm has 155 tillable acres and 121 acres of nontillable farmstead, woods and permanent pasture. Eighty-two acres are rented. Quality of rented land is similar to that owned. Considerable land is rented in the area.

Soils on the farm are primarily Howard, Chagrin and Valois. Of the tillable acreage, approximately 80 acres are Howard, 45 are Valois and 30 are Chagrin. The Howard soils are a gravelly loam soil that is moderately to well drained and adapted to a wide variety of crops; moderate to heavy liming is necessary for optimum crop production. The Chagrin soil is a loam soil on river-bottom land. There is relatively no slope and drainage is moderate. The Valois is a medium textured acid soil with fragipans developed on glacial till. This soil is moderately well drained, but has a high tendency towards erosion. The land, as a total, is well adapted to agriculture. With appropriate fertilizer and lime, the Howard and Chagrin soils can produce good yields.

Clyde was raised on the farm. After attending the University of Maine, he returned home and now owns and operates the farm. He and his wife Claudette have two sons, Clay and Clint. Clay attended Yale University and later graduated from Harvard Business School, he has since become a business manager for the Boston Church of Christ. Clint, on the other hand, just completed his last year at Cornell and has worked in an internship at a large Arizona dairy farm. Clint would like to return home and set up a partnership with his father if the farm can support two families. Claudette is a full-time housewife and does not help out in the operation of the farm. One full-time manager, who Clint would replace upon returning home, and two part-time high school students are also employed.

The farmstead was established in 1946 where the original barn is still standing. Though out of date, the building is sound and provides housing for all the heifers and dry cows. A 50 stall stanchion barn was built in 1970 with an around the barn pipeline. Further addition was completed in 1980 when a 120 freestall was added. All the cows are milked in the stanchions. Dry hay is stored in the old barn and in the stanchion barn, while hay crop silage and corn silage are stored in bulk silos.

The Clements live in a three bedroom farmhouse which is sold but structurally sound. The interior was partially remodeled several years ago.

Clyde's equipment is old but in excellent condition. He stores equipment in a machine shed and does all the repairs himself.

In forming a partnership between Clyde and Clint, the Clements would like to increase herd size to 150 cows and build a new double eight milking parlor. The investment would include adding 45 more cows. Ten heifers will be purchased to insure that there will be enough replacements available during the first year. The Clements plan to purchase 45 acres of Howard soil adjacent to the current farm to meet additional forage needs. Up until last year, this land has been farmed by an elderly neighbor who raises only heifers. While the present freestall has room for only 120 animals, Clyde, after getting a building consultant's opinion and estimate, believes that half of the present stanchion barn can easily be converted such that it is continuous with the present freestall and provide the extra stalls needed. The parlor will be built in the other half of the stanchion barn. A dairy systems specialist told Clyde that he will be able to use a lot of his current milking equipment and trade in the rest to save on parlor construction cost. An addition to the bunk silos currently being used will provide the added silage space needed. There is barn space for added hay.

The Investment will Include:

1. 45 acres at \$800/A	\$ 36,000
2. Bunk Silo	5,000
3. Parlor (less trade-in)	75,000
4. Renovations on Stanchion Barn	10,000
5. 45 Cows @ \$950 each	42,750
6. 10 Heifers @ \$550 each	5,500
Total	<u>\$174,250</u>

In order to appropriately analyze this situation, two analyses need to be conducted: (1) an analysis of 1988, the transition year, and (2) an analysis of the sustainable repayment ability for an average future year. Worksheets 1.A. through 1.I. and 3.A. through 3.E. illustrated on the following pages are completed for an analysis of 1988. Since Worksheet 2.A. is only used to calculate sustainable repayment ability, it is completed for an average future year.

EXPLANATION OF INPUT

Before starting to enter the information on the computer, read the instructions and complete the input form. It is important that the information be entered correctly. It will be easier to enter the data correctly if it can be copied from an input form, especially if a person other than the farm manager is running the program.

* The Clements Farm input for Worksheet 0, which is presented, *
 * is appropriate for analysis of the coming year (1988). *

At the top of the input form (Worksheet 0), there are eight spaces to enter basic identification information on the business and the analysis. It is necessary to complete the left side of this section since this information is used to label the results (printout). The right side appears on the first page of the printout to help label the complete printout but is not used to label individual pages of the results.

Immediately below the identification information (above Worksheet 1.A.) is where the user indicates the type of analysis to be carried out. Enter a "1" in any one of the first three blanks.

A "1" entered after Cash Flow indicates that you want a projection of only the cash receipts and expenses for the planned year and that you plan to enter data only in Section 1 (Worksheets 1.A.-1.H.). Any data entered in Sections 2 or 3 will be ignored.

A "1" entered after Sustainable Debt Repayment Ability indicates that you want a cash flow projection and estimate of debt repayment ability for an average future year. Enter data in Sections 1 and 2. Any data entered in Section 3 will be ignored.

A "1" entered after Proforma Balance Sheet and Income Statement indicates that you want a cash flow for the coming planned year, an assessment as to whether debt payments can be made and proforma income statements and balance sheets. Enter data in Sections 1 and 3. Any data entered in Section 2 will be ignored.

The input data (worksheets) will be printed out unless you tell the computer not to by entering a "1" following Do Not Print Input. It is recommended that for most situations the input be printed. Sometimes, the input that is entered is not exactly the same as the input worksheets, even when the user intends them to be identical. The printout also provides a

record of the actual input finally used in connection with a set of output. When printouts are reviewed some weeks or months after an analysis is completed, it is often difficult to remember the exact situation or assumptions used in an analysis.

Section 1

Worksheet 1.A. Base Year Flows

This worksheet is designed to allow input of the base year cash flows, changes and adjustments to the base year data required to obtain a complete normal year's data, and any specific changes expected for the planned year.

```
*****
* The Clements Farm input presented for Section 1 (Worksheets *
* 1.A.-1.I.) represent expected conditions for 1988. *
*****
```

Base Year Value is the cash received or paid for the item listed for the base year. These numbers can come directly from tax forms (most are on schedule F) or other business records. If your accounting system uses different income and expense categories, aggregate or separate items to conform as closely as possible to the listed breakdowns. A better estimate of planned year cash flow will be generated when the appropriate amount of income or expense appears in each category.

Change in Accounts Receivable or Payable is the change in the account receivable that corresponds to the listed income items or the account payable that corresponds to listed expense items. For example, the change in the account receivable connected with milk sales is the change in the amount outstanding for the December milk check that is not received until January. Notice that this is the change in the account (end of year value minus beginning of year value) and not the amount outstanding at the end of the year. Under Feed Concentrate enter the change that has occurred in the outstanding feed bill over the year. Under Vet & Medicine enter the change in the outstanding vet bill between the beginning and end of the year. Accounts that should be given careful consideration in completing this column include: the milk check, crop sales, feed bill, inseminator bill, vet bill, machinery repair bill, fuel bill, lime & fertilizer bill, seed bill, chemical & spray bill.

Adjustments to Base Year cash flow are unusual occurrences or irregularities in the base year data that should be removed. Any happenings that occurred during the base year that would not be expected to occur in the planned year, should be included. Do not use this column to adjust the base year to what the farmer wishes had happened in the base year. Entries can be made as either a dollar change from the base year or a percent change in the base year value. If entries are made in both columns, both changes will be included.

ANNUAL CASH FLOW AND REPAYMENT ABILITY MODEL
E.L. LaDue and D.B. Cook

INPUT FORM
Version 2.0

Worksheet 0. Identification of Analysis

Name Clyde & Clint Clements Address Clements Road
 Base Year 1987 City Chagrin
 Planned Year 1988 State, Zip ny, 99999
 Analysis ID Expand to 150 cows Prepared by I.D. Consultant

To be calculated (enter 1 to indicate):

Cash flow (only) _____ (Complete Section 1)
 Sustainable debt repayment ability _____ (Complete Section 1 & 2)
 Proforma balance sheet & income statement 1 _____ (Complete Section 1 & 3)
 Do not print input data _____

Section 1:

Worksheet 1.A. Base Year Flows

Item	Base Year Value	Change in Accounts Receivable	Adjustments to Base Year		Planned Deviations ^a	
			\$	%	\$	%
<u>Income</u>						
Milk Sales	<u>193,351</u>	_____	_____	_____	_____	_____
Calf Sales	<u>3524</u>	_____	_____	_____	_____	_____
Cattle Sales	<u>12,158</u>	_____	_____	_____	_____	_____
Crop Sales	_____	_____	_____	_____	_____	_____
Other Farm Receipts	_____	_____	_____	_____	<u>3000</u>	_____
Nonfarm Income	_____	_____	_____	_____	_____	_____
Amount of dairy cattle sales resulting from reduction in herd size during base year			_____			
Increase in raised cattle sales from reduced rate of increase in herd size in planned year			_____			

^a Include only items unrelated to herd size, cropping changes and price level changes.
 Enter in base year dollars.

1.A. Base Year Flows

Item	Base Year Value	Change in Accounts Payable	Adjustments to Base Year		Planned Deviations ^a	
			\$	%	\$	%
<u>Expenses</u>						
Labor	28,707				-9441	
Feed, Concentrate	56,530	-4560				
Feed, Forage	2820					
Breeding Fees	4184					-20
Vet & Medicine	8861					
Replacement Lvstk	1629					
Other Lvstk Exp	8362				+2000	
Machine Repair	9491				+4000	
Auto Expense	833					
Fuel & Oil	2106					
Machine Hire	869					
Lime & Fertilizer	8868		+1000			
Seeds & Plants	3437					
Chemicals & Sprays	2554					
Other Crop Expense	449					
Rent	3912					
Land & Bldg Repair	3585					
Insurance	2760					
Taxes	3688					
Electricity	2612					
Other Utilities	422					
Marketing	11,500					
Miscellaneous	1358					
Family Living Exp	15,000				+9000	

^a Include only items unrelated to herd size, cropping changes and price level changes. Enter in base year dollars. Give special consideration to changes that may occur in labor, rent and machine hire.

Careful consideration should be given to making appropriate adjustments. Adjust for occurrences that made the base year better than normal as well as those that made it worse than normal.

Planned Year Deviations reflect abnormal occurrences that are expected to occur in the planned year. This is not a place to enter hopes for the planned year but should include changes that are expected to occur. Examples include: major repairs to machinery or buildings that occur infrequently, costs of installing twice the normal level of tile drain, increased veterinary expenses due to a planned mastitis control program. Do not include changes expected to result from price changes or changes in animal numbers, crop acres or crop mix. Planned year deviations entered in dollars are incorporated after the effect of changes in animal numbers, acres or crop mix have been calculated. Thus, the value being calculated will be affected by the exact amount of the deviation entered, adjusted for expected change in prices.

The Milk Sales value entered should be gross milk sales. Any assessment, hauling, advertising, cooperative deduction or other marketing charges, should not be subtracted at this point, but should be included in marketing expenses.

Nonfarm Income should be net of nonfarm expenses. Enter gross nonfarm income only if all expenses connected with generation of that income are included in the expenses listed below.

Amount of Dairy Cattle Sales resulting from reduction in herd size during the base year, is the amount (in dollars) of the cattle sales listed above that resulted from a reduction in herd size. For example, if dairy cattle sales were \$8,000, number of cows sold during the year were 20, and herd size decreased by five cows, \$2,000 in cattle sales likely resulted from the reduction of herd size. This number is used to adjust total cattle sales to determine the amount that could be expected to be sold if herd size did not decline.

Increase in Cattle Sales from reduced rate of increase in herd size in planned year is the increase in cattle sales that would have resulted had herd size increased in the base year at the same rate that it is expected to increase in the planned year. For example, if herd size increased by 10 cows in the base year and the increase resulted entirely from freshening of raised animals, but herd size is not expected to increase in the planned year, cattle sales would increase by the value of those 10 animals (between the base and planned year). However, if herd size was expected to increase by six cows in the planned year, only four of the heifers could be expected to be available for sale. On the other hand, if the increase in herd size in the base year resulted from an unusually high number of bred heifers possibly raised specifically to increase herd size in that year, none of the base year increase in herd size would result in planned year cattle sales. In this case a 0 would be entered.

This entry, and the one listed above it, are designed to determine the effect that change in inventory during the base year really has on planned year cattle sales. If herd size increased or decreased modestly or none at all during the base year and is expected to experience a similar

change in the planned year, no entries need to be made in either item. Correspondingly, if herd size increased from raised replacements in the base year and it is expected to increase a similar amount from raised animals in the planned year, no entry need be made in either item.

Labor costs should include any workmens compensation, FICA (social security), bonuses or other cash payments that are directly attributable to labor. Do not include the value of perquisites provided in the form of services or produce (milk, meat, etc.).

Machine Hire includes payments on financial leases for machinery and equipment, as well as payments for machines hired during the year.

Other Livestock Expense includes payments on financial leases on dairy cattle, and all other livestock expenses except breeding fee, vet costs and replacement expenses.

Rent should include lease payments made on land and buildings, as well as normal rental expense.

Taxes includes all property taxes but excludes income taxes paid by the farm operators. Income taxes should be included in the family living expenses.

Marketing Costs should include any milk assessment, hauling, advertising and cooperative deductions subtracted from gross milk sales to determine the amount of the milk check as well as trucking and commission payments made in connection with cattle, grain and forage sales.

Family Living should include the entire amount set aside for family living. It should include cash for income taxes and the farm share of auto, electricity and other utilities. If the nonfarm share of these items are included in the expenses, do not also include them in the family living amount but remember that net farm income is underestimated by that amount of family expenses included in farm expenses.

Worksheet 1.B. Livestock Data

Planned Year Livestock Inventory data includes the number and value of animals on hand at the beginning of the planned year. Include both milking and dry animals. For most businesses, this will be the same as the number on hand at the end of the base year. The expected number to be on hand at the end of the planned year is also required. These numbers should be consistent with the average presented below. For sustainable debt repayment ability (average year cash flow) problems, the end of planned year values should represent end of average future year.

Number of Cows is the average number in the herd throughout the year. Farms with DHIA records should use the rolling herd average number at the end of the year. The planned year values should be the expected average number for the planned year.

Pounds of Milk Sold is the number of pounds of milk actually sold during the year. This is not the DHIA pounds of milk produced.

Worksheet 1.B. Livestock Data

	Planned Year Livestock Inventory		
	Number January 1	Value January 1	Number December 31
Cows	<u>102</u>	<u>89,250</u>	<u>150</u>
Heifers (bred)	<u>26</u>	<u>13,000</u>	<u>38</u>
Heifers (open)	<u>21</u>	<u>9000</u>	<u>25</u>
Calves (under six months)	<u>15</u>	<u>4000</u>	<u>40</u>
	Average		
	Base Year	Planned Year	
Number of:			
Cows	<u>102</u>	<u>126</u>	
Bred Heifers	<u>26</u>	<u>32</u>	
Open Heifers	<u>20</u>	<u>23</u>	
Calves under six months	<u>16</u>	<u>27</u>	
Pounds of Milk Sold	<u>1,504,915</u>		
Percent Change in Production Per Cow		<u>1</u>	
Percent Change in Feed Use (quantity) Per Cow		<u>2</u>	
Change in Milk Price (\$ per cwt.)		<u>-.75</u>	
Per Cwt. Marketing Charge (assessment)	<u>.49</u>	<u>.39</u>	

Percent Change in Production Per Cow is the change in the level of production that is expected to occur between the base year and the planned year. If planned year production is expected to be one percent above base year production, enter 1. If changes are expected to occur for only part of the year, the change should be converted to an annual equivalent.

Percent Change in Feed Use Per Cow is the change in the level of feed use that is expected to occur between the base year and the planned year. All kinds of feed (forages and concentrate) will be changed by this percentage. The change in feed should be consistent with the change in production listed above. If feed use is expected to be two percent above base year use, enter 2.

Change in Milk Prices is the amount that planned year prices will be higher or lower than base year prices. This is the average difference in price for the year. For example, if the price is expected to average \$0.82 per hundredweight less in the planned year, enter \$-0.82

Per Hundredweight Marketing Charge (assessment) should include all per hundredweight marketing charges including the assessment, hauling, advertising and cooperative deductions. Be sure to annualize any changes that occur for only a part of the year.

Worksheet 1.C. Crop Data

Enter the acres of each crop harvested in the base year and the number that are expected to be harvested in the planned year. Base year crop yield should be the yield actually achieved during the base year. Planned year crop yield should reflect what is expected to be achieved. Avoid entering yields that reflect hopes or goals. End of planned year value per unit is the price that is used in establishing the value of end of planned year inventories. It is the price of each ton or bushel that is expected at the end of the planned year. Crop yields and the end of planned year price should be entered in the units indicated. That is, do not enter corn grain in tons.

Worksheet 1.D. Crop Use and Inventories

This worksheet requests information on the base year inventories, purchases and sales of concentrates and forage. These data are used to determine the actual amount of home-grown feeds used during the base year. For each crop indicate both the quantity and price, or value, that was in inventory either at the beginning or end of the year, bought or sold. Quantity is not required for either nonfeed crops nor purchased concentrates. Beginning and ending inventory values will frequently be estimates. Use the same estimates that you would in developing the inventory values for a balance sheet.

This worksheet also provides an opportunity for the user to indicate inventory changes that are expected during the planned year. However, if the beginning of planned year is the same as the end of the base year, which will be true for most situations (except when sustainable cash flow is being calculated) entering a "1" in the first line under concentrate and under forage will tell the computer that planned year beginning inventory

Worksheet 1.C. Crop Production Data

Crop	Crop Acres		Crop Yields ^a		End of Planned Year Price/Unit
	Base Year	Planned Year	Base Year	Planned Year	
Corn Silage (T)	<u>80</u>	<u>105</u>	<u>17</u>	<u>18.3</u>	<u>20</u>
Corn Grain (bu)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
HM Corn (T)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Hay - dry (T)	<u>94</u>	<u>105</u>	<u>2.1</u>	<u>2.8</u>	<u>60</u>
HC Silage (T)	<u>63</u>	<u>72</u>	<u>4.75</u>	<u>6.25</u>	<u>27</u>
Oats (bu)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Wheat (bu)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Other Grain (bu)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Other Forage (T)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Nonfeed Crop (Unit)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

^a Enter on an as-fed basis to be consistent with inventory values.

Worksheet 1.D. Crop Use and Inventories

	Base Year			Planned Year		
	Beginning Inventory	Purchases	Sales	Ending Inventory	Beginning Inventory	Ending Inventory
<u>Concentrate</u>						
Beginning plnd yr inventories same as end base yr (1=yes)					1	
Ending plnd yr inventories same as end base yr (1=yes, 2=not preset)						
Corn Grain						
Price/bu						
HM Corn						
Price/T						
Oats						
Price/bu						
Wheat						
Price/bu						
Other Grain						
Price/bu						
Pur Concentrates						
\$ Value	885			1135		1300
<u>Forage</u>						
Beg plnd yr inventories same as end base yr (1=yes)					1	
Ending plnd yr inventories same as end base yr (1=yes, 2=not preset)						
Hay	56	47		186		200
Price/T	70	60		65		60
HC Silage	330			187		225
Price/T	27			27		27
Corn Silage	558			552		1200
Price/T	20			20		20
Other Forage						
Price/T						
Nonfeed Crop \$						

equals base year inventory and no further entries are required. Similarly, the end of the planned year inventory may be expected to be similar to that for the end of the base year (beginning of the planned year). That can also be indicated by placing a "1" in the first row under concentrates in the Planned Year Ending Inventory column. End of planned year inventories can also be allowed to change depending upon the concentrate and forage use. This is accomplished by entering a "2" in the first row under concentrates. If neither, a "1" or "2" is entered in a planned year column, it is assumed that the user will input the planned year inventory values. The planned year forage inventories can be set in the same manner as indicated for concentrates by entering a "1" or "2" or making no entry in the first row under forages.

Worksheet 1.E. Planned Year Crop Purchases and Sales

Enter the quantity of each crop to be purchased or sold and the expected average price for each. Be sure to use the units (bushels or tons) as indicated in the crop listing.

Excess Production Used as: is used to indicate how excess production is to be used. The model totals (1) the amount of each feed that would be used at the base year feeding rate, (2) the amount to be sold from the worksheet and (3) the amount required for end of year inventories. If production exceeds that total, the remainder will be used for feed and, thus, used to reduce feed purchases or sold depending on the entry in this column. Enter a "1" if any excess production is to be sold. Enter a "0" or make no entry, if the excess is to be used for feed.

Worksheet 1.F. Farm Inventories

Enter the beginning of planned year inventory values for land, building and machinery. Also enter planned year sales of land, buildings and machinery. It is unnecessary to enter beginning of year value for livestock or planned sales of livestock since they have been entered in Worksheets 1.A. and 1.B. Sales of capital items; land, buildings and machinery, will not influence the sustainable debt payment capacity. However, they will be included in cash flows for the coming year.

Enter planned year investments in land, building, livestock and machinery. This should include only added capital investment. Repairs should be excluded. Also, livestock purchased for replacement rather than expansion should be excluded.

Enter the depreciation on machinery and buildings that is expected for the planned year. This number should reflect economic depreciation in the assets owned. However, tax depreciation may be easier to estimate and in many cases will be a good approximation of the appropriate value. These data are used in calculating net income and in determining end-of-year balance sheet values.

Lost Capital (percent loss on new building investment) is the percent of any new building investment that does not increase the market value of the farm. For example, if \$100,000 is invested in buildings and

Worksheet 1.E. Planned Year Crop Purchases and Sales

	Volume of Purchases	Price Per Unit	Volume of Sales	Price Per Unit	Excess Production ^a Used as: Feed=0, Sales=1
<u>Concentrate</u>					
Corn Grain (bu)	_____	_____	_____	_____	_____
HM Corn (T)	_____	_____	_____	_____	_____
Oats (bu)	_____	_____	_____	_____	_____
Wheat (bu)	_____	_____	_____	_____	_____
Other Grain (bu)	_____	_____	_____	_____	_____
<u>Forage</u>					
Hay (T)	_____	_____	_____	_____	_____
HC Silage (T)	_____	_____	_____	_____	_____
Corn Silage (T)	100	20	_____	_____	_____
Other Forage (T)	_____	_____	_____	_____	_____
Nonfeed Crop			_____		

^a Excess over amount required for feed (with rate of use for feed at base year level), sales (indicated on this worksheet) and required inventory. If used for feed, concentrate cost will be reduced rather than increasing feed sales. If left blank, a zero (feed use) is assumed.

Worksheet 1.F. Farm Inventories

Item	January 1 Planned Year	Planned Year		
		Sales	Investment	Depreciation
Land	<u>126,500 a</u>		<u>36,000</u>	
Buildings	<u>83,500 a</u>		<u>65,000</u>	<u>6702</u>
Livestock			<u>48,250</u>	
Machinery	<u>80,400</u>		<u>25,000</u>	<u>4250</u>
Lost Capital (percent loss on new building investment)				<u>40</u>

Base Year Change in Inventory

Item	\$ Change
Machinery Parts	<u>0</u>
Fuel & Oil	<u>+ 100</u>
Breeding Supplies	<u>+ 100</u>
Veterinary Supplies	<u>+ 500</u>
Other Livestock Supplies	<u>0</u>
Fertilizer & Lime	<u>+ 400</u>
Seeds & Plants	<u>+ 200</u>
Chemicals & Sprays	<u>0</u>
Other Crop Supplies	<u>0</u>

^a Split total market value of real estate between land and buildings.

construction of the building increases the value of the farm by only \$60,000, the lost capital is 40 percent.

Base Year Change in Inventory is the change in the value of listed items on hand between the beginning and end of the base year. These are used to adjust the level of cash expenses occurring during the base year to reflect the cost of the total amount of each of these items used during the base year. This is necessary to make an accurate projection of planned year costs. For example, if the fuel and oil inventory was \$2,000 at the beginning of the year and \$500 at the end of the year, the \$1,500 of inventory that was used up is an expense for the year that must be added to cash expenses to get total expense. In this case, enter \$-1,500.

Worksheet I.G. Expected Price Changes Between Base and Planned Years

Enter the estimated change in prices expected from the base year to the planned year. The entries should reflect inflation rates or decreases in prices only. They should not reflect physical changes in the operation of the business. Projected changes in the costs of various items for dairy farming are developed each December by the Department of Agricultural Economics at Cornell University and published in the Agricultural Situation and Outlook Handbook. The handbook has aggregated some of the categories included in this list. Use of the handbook values will require using the rates of price change indicated under the aggregate categories for the individual items included in that category.

Worksheet I.H. Relative Cost Factors

To reflect the change in various costs that result from changes in crop mix, acres or animal numbers, but still base actual costs on the historical experience, a set of relative cost factors for the individual cost items is developed for each enterprise. Corn grain is given a factor of "1" and all other crops are related to corn grain.

Relative cost factors indicate the relationship of the level of costs for each enterprise to other enterprises. For each cost category, the costs for each enterprise are expressed as a percent of the costs for corn grain. For example, fertilizer and lime costs for hay are estimated at 30 percent of the cost for corn. Fertilizer and lime costs for wheat are estimated at 60 percent of corn. The seeds and plants cost for hay are 130 percent of corn. Similarly, the annual fuel and oil costs for one cow are estimated at approximately 130 percent of the fuel and oil costs for an acre of corn.

These factors are used to properly reflect the change in costs that would be expected to occur with a change in the average acreage of individual crops or a change in the number of cows. By using the relative cost factors, the absolute level of costs experienced by this farm during the base year determine the rate of expense during the planned year but the change in number of acres or cows determines the final level.

If the values listed are inappropriate for the farm being projected or a cash crop which will require different weights is planned, enter the estimates on the worksheet next to the listed value. The computer will

Worksheet 1.G. Expected Price Changes Between Base and Planned Years

	% Change		% Change
Calf Prices	_____	Chemicals & Sprays	+ 1
Cull Cow Prices	_____	Other Crop Expense	_____
Other Farm Receipts	_____	Machine Hire	_____
Nonfarm Income	_____	Rent	_____
Labor	+ 3	Land & Bldg Repairs	+ 2
Feed, Concentrate	+ 2	Insurance	- 1
Feed, Forage	_____	Taxes	+ 1
Breeding Fees	_____	Electricity	_____
Vet - Medicine	_____	Other Utilities	_____
Replacement Livestock	_____	Marketing	_____
Other Lvstk Expenses	_____	Miscellaneous	_____
Machine Repairs	_____	Milk Cows	- 1
Auto Expense	_____	Dairy Youngstock	_____
Fuel & Oil	+ 3	Farm Real Estate	_____
Fertilizer & Lime	_____	Used Machinery	_____
Seeds & Plants	_____	Family Living Expenses	_____

Worksheet 1.H. Relative Cost Factors (Corn Grain = 1.0)

Crop	Machine Repair	Fuel & Oil	Fertilizer & Lime	Seeds & Plants	Chemicals & Spray	Other Crop Expenses
Corn Grain	1.0	1.0	1.0	1.0	1.0	1.0
Corn Silage	1.4	1.5	1.0	0.9	1.0	0.5
Hay	0.9	0.9	0.3	1.3	0.1	1.1
HC Silage	0.9	1.0	0.3	1.2	0.1	0.5
Wheat	0.9	1.0	0.6	0.8	0.1	0.7
Oats	0.9	1.0	0.6	0.8	0.1	0.7
Other Forage	1.1	1.2	0.5	1.2	0.4	0.7
Other Grain	0.9	1.0	0.7	0.9	0.4	0.8
Nonfeed Crop	1.0	1.0	1.0	1.0	1.0	1.0
One Cow and Normal Repla	1.8	1.3				

always list the factors entered during the last use of the program. Enter values in the computer only where the desired value differs from the value shown on the screen.

The factors listed in Worksheet 1.H. of this publication were developed from New York Cost Accounts for 1983 (the last available data). Machine repairs for cows include maintenance of silo unloader, feeding equipment, gutter cleaners, skid steer loaders and other manure scrapers, manure spreaders, the share of tractors used to spread manure and milking equipment.

Worksheet 1.I. Feed Use Factors

The feed use factors are used to adjust concentrate and forage use when cattle numbers are different in the planned year than they were in the base year. These factors represent the costs of maintaining an animal for a year. For calves under six months, the annual feed requirement is equal to the feed used for two calves. That is, if a herd averaged 20 calves under six months of age for the year, they would use the feed required to feed 40 calves from birth to six months. In developing the costs listed in this manual, data for raising a heifer from birth to freshening from New York Cost Accounts were used. The average age at freshening was 26.1 months. The time period in various heifer groups was:

Bred Heifer	9 months
Open Heifer	11.1 months
Calf under 6 months	6 months

Values are listed for three production levels: under 13,000; 13,000 to 18,000, and over 18,000 pounds of milk per cow. As the production level changes, the level of feeding for cows relative to heifers, who are on a less variable maintenance and growth feeding program, changes and the proportion of concentrate relative to forage also changes. Higher production requires that a higher proportion of the feed be concentrates.

If the values presented are inappropriate for the herd being projected, enter the appropriate value on the worksheet next to the listed value. On the computer screen, replace the number listed with the corrected value. The computer will always list the factors entered (used) during the last use of the program. Enter values only where the desired value differs from the value shown on the screen. Correct only the values for the production level of the herd (pounds of milk sold divided by average number of cows). If the relative number of animals in the different age groups will remain constant, this section can be skipped.

Section 2

The data entered in Section 2 are used to calculate sustainable repayment ability. Sustainable repayment ability is the amount of cash available for debt payments for an average future year if no major changes are made in the business except those included in the first projected year.

Worksheet 1.I. Feed Use Factors^a (1 dairy cow = 1.0)

Type of Animal	Production Per Cow Per Year (lbs)					
	Less than 13,000		13,000-18,000		over 18,000	
	Concentrate	Forage	Concentrate	Forage	Concentrate	Forage
Cow	1.00	1.00	1.00	1.00	1.00	1.00
Bred Heifers	.11	.56	.09	.58	.07	.60
Open Heifers	.05	.31	.03	.33	.02	.34
Calves ^b (under six mo)	.45	.07	.37	.07	.29	.08

a If the relative numbers of animals in different age groups is unchanged, this section can be skipped.

b Includes cost of milk or milk replacement and any calf started. Includes feed for one animal equivalent for one year (i.e., feeding two calves to six months of age).

When Section 2 is used the data in Section 1 should be modified so that it is representative of an average future year. A different set of Section 1 data will normally be appropriate for an average future year than is used for projecting the coming year.

For many businesses, the amount of principal repaid on machinery loans is less than the amount of new machinery purchased. In this case, either the amount outstanding on machinery (and thus, the annual payments) will increase over time or cash must be set aside for down payments on machinery sufficient to keep debt payments from increasing. The data entered in Worksheet 2.A. are designed to allow the computer to determine the amount of cash that must be set aside.

Worksheet 2.A. Repayment Ability Information

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*****
*   The Clements Farm input presented for Section 2 is appropriate   *
*   for an average future year (this section would not be used       *
*   without also changing the Section 1 data for differences          *
*   between 1988 and an average future year indicated on page 87)    *
*****

```

To estimate the average annual machinery investment required to maintain the base year machinery investment, complete either question 1.a. or 1.b. Data are not required for both. If both are filled in, the computer will use only the data entered in 1.a. The expected annual machinery investment can usually be best estimated by reviewing the average machinery investment over the last few years and adjusting that level for changes in the size of the machinery inventory that have occurred over time and for under or overinvestment that occurred during the period.

If historical data are unavailable or inappropriate, complete question 1.b. Enter the average age at which machinery is traded-in. The age should be weighted by the value of machinery, so give more weight to higher value machines in estimating the average age at trade-in.

Percent of Value of replacement machinery is the percent that the value of items being traded in normally is of the cost of new machinery. For example, if a tractor that cost \$50,000 ten years ago is being traded-in on a new tractor, and the dealer allows \$7,000 for the old tractor on purchase of a new tractor that could be bought for \$70,000 cash, the percent to enter is 10 (not 14).

Debt that Could be Refinanced for machinery purchases is the amount of outstanding intermediate term debt (that will be outstanding if the financing plan being assessed is adopted) that can be rolled over or refinanced annually to finance the purchase of new machinery. This will usually include debt to institutional lenders such as banks, Farm Credit or FmHA. Debt that cannot be refinanced should be excluded. If refinancing is not allowed or desired, enter zero.

Interest Rate is the interest rate that will be paid on machinery loans that are refinanced to obtain financing for purchase of replacement

Section 2.
Worksheet 2.A. Repayment Capacity Information

- 1.a. Expected annual machinery investment required to maintain base year machinery investment (base year \$) 20,100

OR

- b. Average machinery trade-in:

Age (years) _____

Percent of value of replacement item _____

2. Debt that could be refinanced for machinery purchases

Principal outstanding \$ 120,000

Likely refinance terms:

Interest Rate (%) 10

Term (years) 7

machinery. This is the average interest rate expected to be paid on machinery loans over the next few years.

Term (years) is the number of years over which refinanced machinery loans are to be repaid. It is the number of years over which such loans are amortized.

Section 3

Section 3 input data include the debts outstanding and the additional asset information needed to complete the proforma income statement and balance sheet and determine the amount of scheduled debt payments. These data all relate to the planned year (usually the coming year), not to an average future year.

* The Clements Farm input presented for Section 3 are appropriate *

* for analysis of next year (1988). *

Worksheet 3.A. Existing Debt and Account Payable Information

All debts and accounts payable with outstanding balances at the beginning of the planned year should be entered on this worksheet except those being repaid with percent or per hundredweight milk assignments. Loans with fixed payments that are paid through an assignment should be included. For accounts payable enter the amount outstanding, the interest rate, if interest accrues, and any payments to be made.

Lender is the name or other identification of the lender. In cases where more than one loan is from the same lender, include a loan number or other identification of the individual loans to make the output more understandable.

Balance 1/1 Planned Year is the outstanding principal balance on the loan at the beginning of the planned year. For Farm Credit Service loans with essentially automatic cancellation of stock (stock is maintained at a set percent of the current unpaid balance on the loan and reduced as the principal is repaid, either at the time of loan payment or on a monthly basis), enter the net loan balance excluding the value of the stock and enter the stock requirement percentage in the column headed Stock Requirement Percent. For Farm Credit Service loans with end-of-period cancellation, enter the loan balance including the value of the stock and then enter the value of the stock owned in the column titled "stock requirement amount". For automatic cancellation where the stock is limited to \$1,000, enter as automatic cancellation if the principal is less than the maximum principal on which stock will be required (\$1,000/stock requirement percent expressed as a decimal) and as end of period if it exceeds that amount. For example, with a two percent stock requirement and maximum stock of \$1,000, loans under \$50,000 would be entered as automatic cancellation and those over \$50,000 would be entered as end of period.

[illegible]

^d Enter number of months only if loan is to be paid in full ahead of time.

Interest Rate is the rate of interest to be paid on the loan during the planned year. If the rate is expected to change, enter the average rate to be paid, weighted by the period of time the various rates are expected to be in effect.

Amount of Payment is the amount of each payment scheduled to be made and includes both principal and interest.

Number of Payments Per Year is the number of payments per year to be made on the loan. This number is used to determine the frequency of payments. If monthly payments are made, enter 12 even if the loan will be paid off during the planned year with fewer than 12 payments.

Month of Last Payment is the number of the month in which a payment was last made on this loan. For example, if the last payment was made in November, enter 11. This number is used to calculate the interest outstanding on the loan and to schedule payments for loans that are paid less frequently than monthly.

Stock Requirement Amount is the amount of stock outstanding on Farm Credit Service loans with end-of-period cancellation of stock (the amount of stock remains constant throughout the life of the loan). Make no entry for loans with automatic cancellation of stock. For automatic cancellation loans where stock is limited to \$1,000, treat loans with principal balances under the maximum principal balance on which stock will be required (\$1,000 divided by the stock requirement in decimal form) as automatic cancellation and those over that amount as end of period cancellation.

Stock Requirement Percent is the percentage of the total gross loan (loan proceeds plus stock) that must be invested in stock. This ranges from two to 10 percent. Enter the percentage in this column only for loans with automatic cancellation of stock (the stock amount is automatically adjusted to the required percentage, when payments are made or monthly, of the loan and only interest is paid on the stock). Make no entry in this column for loans with end-of-period cancellation of stock. For automatic cancellation loans with a maximum stock requirement (usually \$1,000) calculate the maximum on which the principal balance would be required (\$1,000 divided by stock requirement percent expressed in decimal form). Treat loans with a principal balance in excess of that amount as end of period and those with less as automatic cancellation.

Original Term (years) is the number of years over which the loan was originally amortized (to be repaid). This is used in determining whether the loan is current, intermediate or long term for appropriate placement on the balance sheet.

Month Paid in Full is used only when a loan is being paid off during the planned year and earlier than scheduled. This would normally occur when loans are being refinanced or excess cash allows faster than scheduled repayment. If a loan is being refinanced, enter the number of the month the refinancing is to occur and enter a new loan with the amount of principal being refinanced and the new terms on Worksheet 3.C. If a loan is being repaid early, just enter the month of the early repayment. In the Grey farm example, the loans are being refinanced in July.

Worksheet 3.B. Milk Check Assignments

All loans that are repaid through a percent of the milk check or a dollar per hundredweight assignment are entered on this worksheet. A loan with a fixed payment amount but paid through an assignment should be included in Worksheet 3.A. above. If there is only one loan connected with an assignment, enter the information on one of the first four lines. If there is more than one loan for an assignment list them under assignment A or assignment B.

Lender and Loan is the name or other identification for each loan. In cases where there is more than one loan from a single lender, such as assignment A or B, include loan number or other identification to make the output more understandable.

Assignment Amount is the percent of the milk check or the dollars per hundredweight to be deducted from the milk check and applied to the loan or loans. Enter the milk check in percent form; 12.5 percent is entered as 12.5, not .125. Enter a per hundredweight deduction in dollar form; 25 cents is entered as .25.

Type, %MC = 1, \$/cwt = 2 is where you indicate whether the assignment amount is a percent of the milk check, by entering 1, or an amount per hundredweight, by entering 2. For example, if 12.5 is entered under assignment amount, the deduction will be 12.5 percent of the milk check if "1" is placed in this column and \$12.50 per hundredweight, if a "2" is entered in this column.

Balance 1/1 Planned Year is the outstanding principal balance on the loan at the beginning of the planned year. For Farm Credit Service loans with automatic cancellation of stock (stock is maintained at a set percent of the current unpaid balance on the loan and reduced as the principal is repaid), enter the net loan balance excluding the value of the stock and enter the stock requirement percentage in the column headed Stock Requirement Percent. For Farm Credit Service loans with end-of-period cancellation, enter the loan balance including the value of the stock and then enter the value of the stock owned in the column titled Stock Requirement Amount. For automatic cancellation loans with a maximum stock amount (like \$1,000), calculate the maximum principal on which stock is required (i.e., $\$1,000 / .02 = \$50,000$). Treat loans under that amount as automatic cancellation and those over that amount as end of period cancellation.

Interest Rate is the rate of interest to be paid on the loan during the planned year. If the rate is expected to change, enter the average rate to be paid, weighted by the period of time the various rates are expected to be in effect.

Percent to Principal is the percent of the assigned funds left over after paying interest on all loans that is to be applied to the principal of each loan. This is to be entered if the scheduled payments are not entered in the following column. To illustrate how this procedure works, assume there are two loans, X and Y, entered percent to principal is 60 percent for X and 40 percent for Y, total assigned funds are \$10,000 and

Worksheet 3.B. Milk Check Assignments

Lender	Assign- ment Amt	Type: %MC=1 \$/cwt=2	Bal 1/1 Planned Year	Int Rate	% Bal to Prin	Sch Pmt ^c	Stock Require \$ ^a % ^b	Orig Term (Yrs)	Month Paid in Full ^d
<u>Single Loan Assignments</u>									
Bank	10	1	110,498	11	100			20	6
Assignment -- Multiple									
Loan A:									
Assignment -- Multiple									
Loan B:									

^a End of period cancellation loans only.

^b Automatic cancellation loans.

^c Enter either scheduled payment or percent balance to principal for each assignment (not both).

^d Enter number of month only if loan is to be paid in full ahead of time.

the interest on the two loans is \$6,000, the remaining \$4,000 will be split with \$2,400 going to X and \$1,600 to Y.

Scheduled Payment is the payment required on loans that are paid through part of a milk assignment. These payments are used to divide the assigned funds among the loans. Payments are entered if the highest priority (first listed under this assignment) loans are to receive full payment and any excess or deficit funds left after paying all but the lowest listed loan will be assigned to the lowest listed loan. Any payment entered for the last listed loan will be ignored. Do not enter payments in this column if you entered percent of principal in the last column.

Stock Requirement Amount is the amount of stock outstanding on Farm Credit Service loans with end-of-period cancellation of stock (the amount of stock remains constant throughout the life of the loan). Make no entry for loans with automatic cancellation of stock. For automatic cancellation loans with a maximum stock amount (like \$1,000), calculate the maximum principal on which stock is required (i.e., $\$1,000 / .02 = \$50,000$). Treat loans under that amount as automatic cancellation and those over that amount as end of period cancellation.

Stock Requirement Percent is the percentage of the total gross loan (loan proceeds plus stock) that must be invested in stock. This ranges from two to 10 percent. Enter the percentage in this column only for loans with automatic cancellation of stock (the stock amount is automatically adjusted to the required percentage of the loan and only interest is paid on the stock). Make no entry in this column for loans with end-of-period cancellation of stock. For automatic cancellation loans with a maximum stock amount (like \$1,000), calculate the maximum principal on which stock is required (i.e., $\$1,000 / .02 = \$50,000$). Treat loans under that amount as automatic cancellation and those over that amount as end of period cancellation.

Original Term (years) is the number of years over which the loan was expected to be repaid (amortized). This is used to place the loans in the correct position on the balance sheet. A number greater than 10 is a long term loan; one to 10 is an intermediate term loan.

Month Paid in Full is used only when a loan is being paid off during the planned year and earlier than scheduled. This would normally occur when loans are being refinanced or excess cash allows faster than scheduled repayment. If a loan is being refinanced enter the number of the month the refinancing is to occur and enter a new loan with the amount of principal being refinanced and the new terms on Worksheet 3.C. If a loan is being repaid early, just enter the month of the early repayment. If loans under a milk assignment are repaid early, all loans under the assignment must be paid off at the same time and the assignment discontinued.

Worksheet 3.C. New Debt Information

On this worksheet enter information on loans with fixed payments to be taken out during the planned year. Loans with fixed payments that are paid through a milk assignment should be included.

3.C. New Debt Information

Lender	Amount Borrowed	Int Rate	Term (Yrs)	No. of Pmts Per Yr	Month Borrowed	Stock Require		Month Paid in Full
						\$ ^a	% ^b	
<u>Bank</u>	<u>120,000</u>	<u>10</u>	<u>7</u>	<u>12</u>	<u>6</u>			

^a End of period cancellation loans only.

^b Automatic cancellation loans.

Lender, Interest Rate and No. of Payments Per Year have the same definitions as indicated for Worksheet 3.A. above.

Amount Borrowed is the amount of money to be borrowed. If the loan is obtained from the Farm Credit Service with automatic cancellation of stock (stock is maintained at the set percent of the current unpaid balance on the loan and reduced on the principal is repaid) enter only the net proceeds of the loan (the amount the farmer gets to use). For Farm Credit Service loans with end-of-period cancellation (the original amount of stock is maintained throughout the life of the loan) enter the complete loan amount including the stock. For end-of-period loans, the total amount of the loan can be calculated by dividing the amount of the net loan amount (required for the farm business) by one minus the stock requirement percentage. For example, a farmer who plans to borrow \$95,000 for his farm business from a Farm Credit office with a five percent stock requirement will have a gross loan (proceeds plus stock) of \$100,000 ($\$95,000 / (1 - .05)$).

Term is the number of years over which the loan will be repaid (amortized).

Month Borrowed is the month the money is to be obtained.

Stock Requirement Amount is entered only for end-of-period cancellation loans and is the amount of stock to be purchased when the money is borrowed. In the example given above under "amount borrowed" the amount of stock is \$5,000 ($\$100,000 - \$95,000$). For automatic cancellation loans with a maximum stock amount (like \$1,000), calculate the maximum principal on which stock is required (i.e., $\$1,000 / .02 = \$50,000$). Treat loans under that amount as automatic cancellation and those over that amount as end of period cancellation.

Stock Requirement Percent is the percentage of the total gross loan (loan proceeds plus stock) that must be invested in stock. This ranges from five to 10 percent. Enter the percentage in this column only for loans with automatic cancellation of stock (the stock amount is automatically adjusted to the required percentage of the loan and only interest is paid on the stock). Make no entry in this column for loans with end-of-period cancellation of stock. For automatic cancellation loans with a maximum stock amount (like \$1,000), calculate the maximum principal on which stock is required (i.e., $\$1,000 / .02 = \$50,000$). Treat loans under that amount as automatic cancellation and those over that amount as end of period cancellation.

Month Paid in Full has the same meaning as indicated for Worksheets 3.A. and 3.B. Most new loans would not be paid off during the planned year. However, this can be used for operating loans that will be taken out and paid off during the planned year. If money is borrowed in one month (say May) and repaid in another month (say November) the loan can be entered as a new loan with a month borrowed of five and month paid in full of 11. If a new loan is to be paid off during the year with monthly payments, enter 12 in the number of payments per year and enter the term of the loans as a decimal or a fraction. For example, with a loan borrowed in April and repaid with seven monthly payments (through November), enter 12 under number of payments per year and .5833 or 7/12 under term (year).

Worksheet 3.D. New Milk Check Assignments

Amount borrowed, interest rate, stock requirement amount, stock requirement percent and original term (years) are all interpreted in the same manner as for other new loans (see Worksheet 3.C.). Assignment amount, type: %MC = 1, \$/cwt = 2, percent to principal and payment are all interpreted in the same manner as for existing assignments (see Worksheet 3.B.). New milk check assignments cannot be paid in full during the planned year.

Worksheet 3.E. Additional Investment Data

These data are used to complete the proforma balance sheets.

Checking and Savings is the amount of money in the checking and savings account at the beginning of the planned year. This is used as the beginning of year balance sheet value and the account to which cash surpluses and deficits are added.

Marketable Bonds and Securities is the market value of bonds and securities held.

Supplies Inventory is the inventory value of items used in production excluding crops and feed. This includes such items as fertilizer, gas and oil, spray and chemicals on hand, semen and other breeding supplies and veterinary supplies (all items listed at the bottom of Worksheet 1.F.).

Accounts Receivable includes all income that has been earned but not received that expected to be received sometime in the future. On dairy farms the largest account receivable item will often be the milk check to be received in January for the prior December's milk production.

Estimated Value of Operator and Family Labor and Management is the farmer's best estimate of the value of the value of operator labor, family labor and operator management of the farm business. Include the value for all operators and families involved in the business. This number is used only in calculating the rate of return on investment and rate of return on equity. A high value for labor and management will decrease these rates of return. If no entry is made, the model will use \$9,000 (for labor) plus five percent of adjusted gross receipts where adjusted gross receipts is total gross receipts minus value of purchased feed and replacements purchased.

Worksheet 3.D. New Milk Check Assignments

[illegible]

Worksheet 3.E. Additional Investment Data

	Planned Year Market Value ^a	
	Jan 1	Dec 31
Checking and Savings	<u>19,000</u>	
Marketable Bonds & Securities	<u> </u>	<u> </u>
Supplies Inventory	<u>3500</u>	<u>5500</u>
Accounts Receivable	<u>17,000</u>	<u>25,000</u>

Estimated value of operator and family labor and management ^b		<u>30,000</u>

- a Be sure these values are consistent with the other values entered in the model. These values will not influence the cash flow, but do reflect the proforma balance sheet and income statement.
- b Include all operators (and families). If no entry is made, the model will use \$9,000 (labor) plus five percent of gross receipts after subtracting the value of feed purchases and purchased replacements.

DESCRIPTION OF OUTPUT

As indicated in the previous section, both the input and the results of running the program can be printed. See the section on "Running the Program" (page 55) for instructions on how to print.

Printout of Input

Both the input and the output are printed when you select PRINT from the menu unless you indicate on Worksheet 0 that you do not want the input printed. As detailed below, the computer will print only that part of the input which is needed for the type of analysis (calculations) you select on Worksheet 0. The identification of farm situation listed on Worksheet 0 is printed on the cover page in a slightly revised format. The information on the type of calculations to be made is not printed.

<u>Type of Calculations</u>	<u>Input Printed</u>
Cash Flow	Section 1 (Worksheets 1.A.-1.I.)
Sustained debt repayment ability	Sections 1 and 2 (Worksheets 1.A.-1.I. and 2.A.)
Proforma balance sheet and income statement	Sections 1 and 3 (Worksheets 1.A.-1.I. and 3.A.-3.E.)

The Results

The results generated, and printed, by the model depend on the type of analysis selected on Worksheet 0. The alternatives are presented below:

<u>Type of Calculations</u>	<u>Output Printed</u>
Cash Flow	Estimated cash flows
Sustained debt repayment ability	Estimated cash flows Sustainable debt repayment ability
Proforma balance sheet and income statement	Estimated cash flows Proforma market value balance sheet Proforma income statement Financial ratio analysis

Estimated Cash Flows

Two sets of cash flows are printed out: the adjusted accrual base year flows and the planned year cash flow.

Base Year Adjusted Accrual for most items is the cash flows for the base year plus (1) changes in accounts receivable or payable, (2) any adjustments to the base year that are entered on Worksheet 1.A., and (3) the change in base year inventory of the corresponding item from Worksheet 1.F. Except for dairy cattle, feed-concentrate and feed-forage, all items for which no corresponding inventory appears on Worksheet 1.F. are calculated using the this procedure but excluding consideration of inventories.

For dairy cattle the inventory adjustment is accomplished by subtracting the "amount of dairy cattle sales resulting from a reduction in herd size" (Worksheet 1.A.) and adding the increase in raised cattle sales form reduced rate of increase in herd size in planned year (Worksheet 1.A.).

Feed-concentrate is calculated using the general procedure described above except that the change in inventory comes from Worksheet 1.D. If the inventory for any grain declined, the amount of the decline is added to feed-concentrate used. The value of any increases in inventory is added to crop sales. The same procedure is used for forage except that the decrease in a forage item is added to feed-forage and the increase is added to crop sales. The base year adjusted accrual value represents the normal base year accrual value that would be expected to occur in the planned year if no changes were made in business operation, cost levels or production levels.

Cash Flow is the cash flow estimated for the planned year based on the data input in Section 1. For most income items, the model first calculates the actual base year income by adding the change in accounts receivable to the cash received during the year. This number is then modified by the "adjustments to base year" listed to obtain a "normal base year value." For most expense items, the change in accounts payable (Worksheet 1.A.) and the change in inventory for the corresponding supply item (Worksheet 1.F.) are added to the cash expense to obtain the actual expense incurred. This is then modified by the listed adjustments to base year to obtain a "normal base year value." For both income and expense items, a "modified base year value" is calculated by inflating (or deflating) the normal base year value with the expected price change from Worksheet 1.G. For most items, the modified base year value is converted to the planned year value by; (1) using logic specific to the value being calculated (which is discussed below), and (2) incorporating the planned deviations listed on Worksheet 1.A. Deviations are incorporated by multiplying by one plus the percent deviation (in decimal form) or by adding the deviation when it is expressed in dollar form.

Milk Sales is the planned year production multiplied by planned year price. Planned year production is the base year pounds of milk sold, divided by average base year number of cows, multiplied by one plus the percent change in production per cow, multiplied by the average number of

cows in the planned year (all from Worksheet 1.B.). The average base year price is calculated by dividing base year pounds of milk sold (Worksheet 1.B.) into the sum of milk sales, change in accounts receivable under milk sales and adjustments to base year milk sales (Worksheet 1.A.). The base year price is converted to the planned year price by adding the change in milk prices from Worksheet 1.B.

Calf Sales is determined by multiplying the modified base year value by the ratio of the average number of cows in the planned year to the average number of cows in the base year (Worksheet 1.B.) and incorporating the deviations from Worksheet 1.A.

Cattle Sales. The value of normal year cattle sales are calculated as the base year cattle sales, plus account receivable and adjustments, minus dairy cattle sales resulting from a reduction in herd size during the base year (Worksheet 1.A.), plus increased sales of raised cattle in the planned year resulting from a reduction in the rate of increase in herd size (Worksheet 1.A.). The planned year value is the normal year value, multiplied by one plus the expected price change cull cow prices (Worksheet 1.G.), followed by incorporation of the deviations (Worksheet 1.A.).

Crop Sales is the sum of the sales for each crop from Worksheet 1.E. plus the value of any excess crops available for sale calculated under concentrate or forage expense. The volume of sales for each concentrate and forage are multiplied by the price per unit (Worksheet 1.E.) to get the value of planned sales for each crop.

Other Farm Receipts is the modified base year value plus the deviations from Worksheet 1.A.

Nonfarm Income is the modified base year value plus deviations from Worksheet 1.A.

Total Farm Income is the total cash income generated by the business. It includes all items listed above except nonfarm income.

Total Income is total cash income from farm and nonfarm sources. It is calculated as total farm income plus nonfarm income.

Labor is the modified base year value plus deviations. Labor does not automatically change with changes in the number of cows or acres. If the amount of labor to be used in the planned year is different than the adjusted base year value, the change should be entered in the deviations on Worksheet 1.A.

Feed-Concentrate is determined by the cropping program, purchases and sales of grains and the consumption by animals. First, the apparent base year use of corn grain, high moisture corn, oats, wheat and other grain is determined using the inventory, purchase and sale data from Worksheet 1.D. and the crop production data for the same crops from Worksheet 1.C. Base year use of each crop is the base year beginning inventory, plus base year purchases, plus base year production (yield times acres), minus base year sales, minus base year ending inventory.

The base year number of cow equivalents is calculated from the average number of cows, bred heifers, open heifers and calves from Worksheet 1.B. and the relative feed consumption coefficients from Worksheet 1.J. For example, a herd producing over 18,000 pounds of milk per cow, with 50 cows, 10 bred heifers, 20 open heifers and 10 calves would have a concentrate cow equivalent of:

$$\begin{array}{rcl}
 50 \times 1.00 & = & 50.0 \\
 10 \times .07 & = & .7 \\
 20 \times .02 & = & .4 \\
 10 \times .29 & = & 2.9 \\
 \hline
 \text{Total cow equivalent} & & 54.0
 \end{array}$$

Separate cow equivalent numbers are calculated for forage and concentrates. Base year use per cow equivalent is calculated by dividing the base year use by the base year number of cow equivalents.

Planned year use per cow equivalent is calculated by multiplying the base year use per cow equivalent by one plus the percent change in feed use per cow from Worksheet 1.B. Planned year use is the planned year use per cow equivalent multiplied by the planned year cow equivalent calculated using the planned year livestock numbers from Worksheet 1.B. and the relative feed consumption coefficients from Worksheet 1.J.

The amount of each crop that is available for use in the planned year is the planned year beginning inventory (Worksheet 1.D.) plus crop production (Worksheet 1.C.), plus planned purchases (volume times price, Worksheet 1.E.), minus planned sales (volume times price, Worksheet 1.E.), minus planned year ending inventory (Worksheet 1.D.). If the planned year ending inventory is not set (a 2 is entered in the first blank under planned year ending inventory for concentrates) the ending inventory is set at zero in determining the amount available.

Planned year use is then compared to the amount of that crop available in the planned year. If the ending inventory is not preset and use is less than the total available, the ending inventory is set at the difference (amount left) and nothing is added to purchases or sales. If the ending inventories are preset or planned use exceeds the amount available, planned year use is compared to the amount available and any excess or deficit quantity calculated. A deficit is valued at the price paid for that crop if any was purchased during the year (Worksheet 1.E) or the end of planned year price (Worksheet 1.C.) if none was purchased. The value of the deficit is added to feed, concentrate expense. An excess is valued at the price received for any of that crop that was sold (Worksheet 1.E.) or the end of planned year price (Worksheet 1.C.), if none was sold. The value of the excess is added to crop sales.

The above procedure is used for all grain crops listed under concentrates on Worksheet 1.D. Purchased concentrates are handled with slightly different procedures. Base year use calculations start with the modified base year expense using data from Worksheet 1.A. (Base year value, plus change in accounts payable, plus, adjustments to base year). From this is subtracted the base year purchases of corn grain, high moisture corn, oats, wheat and other grain from Worksheet 1.D. to obtain the net

value of base year purchased concentrates. The net base year purchased concentrates are divided by the base year cow equivalents to obtain the base year purchased concentrates per cow equivalent. This per cow value is multiplied by one plus the percent change in feed use in decimal form (Worksheet 1.B.) and the expected change in feed-concentrate price, in decimal form (Worksheet 1.G.), to obtain the planned year use per cow. Planned year use per cow is multiplied by the planned year cow equivalent and deviations in feed-concentrate costs from Worksheet 1.A. are incorporated to obtain total purchased concentrate cost. Total purchased concentrates are then added to feed-concentrate expense.

Finally, the planned year purchases of corn grain, high moisture corn, oats, wheat and other grain (Worksheet 1.E.) are added to feed-concentrate expense,. Thus, feed-concentrate expense includes planned purchased grain, purchased concentrate expense and unplanned grain purchases (grain purchases required to meet the use requirements of the herd).

Feed-Forage is determined by inventories and base year purchases and sales from Worksheet 1.D., planned year purchases and sales from Worksheet 1.E. and crop production from Worksheet 1.C. for corn silage, dry hay, hay-crop silage and other forage in the same manner as was explained for grains under feed-concentrate.

Breeding Fees are calculated by multiplying the modified base year value by the ratio of the number of cows in the planned year to the number of cows in the base year and then incorporating the deviations from Worksheet 1.A. The inventory item used in calculating the modified base year value is breeding supplies.

Vet Medicine expense is calculated by multiplying the modified base year value by the ratio of number of cows in the planned year to the number of cows in the base year and then incorporating the deviations from Worksheet 1.A. The inventory item used in calculating the modified base year value is veterinary supplies.

Replacement Livestock expense is calculated by multiplying the modified base year value by the ratio of number of cows in the planned year to the number of cows in the base year and then incorporating the deviations from Worksheet 1.A.

Other Livestock Expense is calculated by multiplying the modified base year value by the ratio of number of cows in the planned year to the number of cows in the base year and then incorporating the deviations from Worksheet 1.A. The inventory item used in calculating the modified base year value is other livestock supplies.

Machinery Repair is calculated by first determining the modified base year value which is the base year value, plus adjustments to base year plus accounts payable (Worksheet 1.A.), plus change in machinery parts inventory (Worksheet 1.F.), multiplied by the change in machine repair prices (Worksheet 1.G.). That value is then adjusted for the change in number of cows and the acres of individual crops using the weight factors on Worksheet 1.H. The weight factors represent the percent that the

respective cost for each cow or acre of each crop are of the same cost for corn. For example, the machine repair cost on corn silage are estimated at 140 percent of the machine repair cost for corn grain. Similarly, the machinery cost for one cow and normally associated replacements is 180 percent of the cost for an acre of corn. These factors were derived from New York Cost Account records. However, they can be altered in the program to fit the cost experience of a particular farm. The total corn acres equivalent for the base year is calculated by multiplying the base year number of acres or cows by the respective coefficient and summing over all enterprises. This total corn acre equivalent number is then divided into the modified base year value to determine the cost per acre of corn equivalent. This cost is then multiplied by corn acre equivalent calculated for the planned year using the coefficients from Worksheet 1.H. and the planned year number of acres and animals. Finally, the deviations from Worksheet 1.A. are incorporated to determine the level of planned year expense.

Auto Expense is the modified base year value plus deviations without further adjustments.

Fuel and Oil is calculated using the same procedure as used for machinery repair except that the change in inventory used is that for fuel and oil from Worksheet 1.F. and the weight factors are those listed under fuel and oil from Worksheet 1.H.

Lime and Fertilizer is determined using the same procedure as outlined under machinery repair except that the number of cows does not enter the calculations. The inventory change for lime and fertilizer from Worksheet 1.F. and the weight factors under fertilizer and lime from Worksheet 1.H. are used.

Seeds and Plants expense is determined using the same procedure as outlined under machine repair except that number of cows does not enter the calculations. The inventory change is that for seeds and plants from Worksheet 1.F. and the weight factors on Worksheet 1.H. are listed under seeds and plants.

Spray and Chemical costs are determined using the same procedure as outlined for machine repair except that number of cows does not enter the calculations. The inventory change for chemicals and sprays from Worksheet 1.F. and weight factors for chemicals and sprays from Worksheet 1.H. are used.

Other Crop Expense is determined using the same procedure as outline for machine repair except that number of cows does not enter the calculations. The inventory change for other crop supplies from Worksheet 1.F. and the weight factors for other crop expense from Worksheet 1.H. are used.

Custom Work is the modified base year value adjusted to include the deviations from Worksheet 1.A.

Rent is the modified base year value adjusted to include the deviations from Worksheet 1.A.

Land and Building Repair is calculated by multiplying the modified base year value by the ratio of end of year building investment to beginning of year building investment and then incorporating deviations from Worksheet 1.A. Beginning of year building investment comes from Worksheet 1.F. and end of year building investment is calculated as the beginning of year building investment minus planned year sales, plus planned year investment, minus lost capital on planned year investment (beginning investment that does not add to the market value).

Insurance Costs are calculated by multiplying the modified base year value by the ratio of planned year to base year market value of assets (buildings, machinery, livestock and crops) and then incorporating deviations from Worksheet 1.A. Beginning of year inventories of buildings, livestock and machinery are taken from Worksheet 1.F. Crop inventories are taken from Worksheet 1.D. End of year building investment is calculated as the beginning of year value, minus sales, plus investment, minus lost capital on investment, minus building depreciation. End of year machinery investment is the beginning of year value minus sales, plus investment, minus depreciation. These values come from Worksheet 1.F. End of year livestock value is the end of year value for each livestock category indicated on Worksheet 1.B. For cows the January 1 of the planned year value is divided by the January 1 number of cows to obtain the beginning of year price per cow. The price per cow is adjusted for the expected change in milk cow prices from Worksheet 1.G. and then multiplied by the end of year number of cows from Worksheet 1.B. Values for the various youngstock categories are calculated using the same procedure except that the expected change in dairy youngstock price is used from Worksheet 1.G.

Taxes are calculated by multiplying the modified base year value the ratio of end of year real estate assets to beginning of year real estate assets and then incorporating the deviations from Worksheet 1.A. Beginning of year real estate assets is the sum of the land and buildings values from Worksheet 1.F. End of year land value is the beginning of year value minus sales, plus investment. End of year building value is the beginning of year value minus sales, plus investment, minus lost capital on investment.

Electricity is calculated by multiplying the modified base year value by the ratio of milk production in the planned year to production in the base year and then incorporating the deviations from Worksheet 1.A.

Marketing Costs are first divided into two groups: those related to pounds of milk sold and all others. Milk hauling, advertising, CCC assessments, coop dues and milk marketing organization deductions are all normally determined by the pounds of milk sold. The base year cost of these items per hundredweight of milk from Worksheet 1.B. multiplied by the base year hundredweight of milk is subtracted from the total base year marketing expense to determine "other marketing expenses". Other marketing expenses are then converted to a modified base year value using the adjustments from Worksheet 1.A. and the expected change in marketing prices from Worksheet 1.G. Planned year "other marketing expense" is then calculated by multiplying the modified base year value by the ratio of income from calf, cull cow and crop sales in the planned year to that of the base year and incorporating deviations from Worksheet 1.A. These

expenses are then added to the planned year per hundredweight charges indicated on Worksheet 1.B. multiplied by the hundredweight of milk produced in the planned year to determine total planned year marketing expense.

Miscellaneous Expenses are calculated by (1) multiplying the modified base year expenses by the ratio of all other expenses in the planned year to all other expenses in the base year and (2) incorporating the deviations from Worksheet 1.A.

Family Living Expense is the modified base year value, calculated using the adjustments (Worksheet 1.A.) and expense price changes (Worksheet 1.G.), plus the deviations from Worksheet 1.A.

Total Farm Expense for the planned year is the total cash expense for the business for the year. It includes all expense items listed above except family living expenses. The base year adjusted accrual total farm expenses indicate the level of expenses that could be expected in a normal future year if no changes were made in business operation, cost levels or production levels. This is an accrual base number which includes changes in accounts payable and changes in inventory values.

Total Farm and Family Living Expense is the sum of total farm expenses and family living expenses. This represents the total outflow of the business before considering debt repayment or investment.

Total Expenses are equal to total farm expenses from above. All nonfarm expenses are subtracted from nonfarm income and only the net nonfarm income is included as part of total income.

Net Income in the base year adjusted accrual column is the net accrual income that would be expected from this business in a normal year if no changes were made in business operation, cost levels or production levels. Net income in the cash flow column is the net cash income estimated for the planned year.

Capital Sales is the total value of sales of capital assets expected in the planned year (Worksheet 1.F.). This represents cash that will be generated by the business which can be used for investment, debt repayment or family living expenses.

Available for Debt Payments and Investment is the total cash generated by the business minus estimated family living expenses and is the amount of funds expected to be available in the planned year to make all debt payments as well as downpayments or outright purchase of investment items.

Sustainable Debt Repayment Ability

If Section 2 of the input is completed, the model calculates the sustainable debt repayment ability of the business. Sustainable debt repayment ability is the amount of cash that is expected to be available for debt repayment in an average future year if no additional changes are

made to the business. For a cash flow and financial plan to be feasible, this number must exceed the expected payments on long term, intermediate term and short term debt and interest on operating debt. Principal payments on operating debt are excluded since they are already represented in the cash flow in the expenses in the form of fertilizer expense, feed expense, etc.

Net Farm Income is calculated from cash farm income and cash farm expenses taken directly from the estimated cash flows. This indicates the cash generated by the farm business to be used for family living, debt payment and investment.

Available for Debt Payments and Investment is the net farm income plus nonfarm income minus family living expenses (both taken from the estimated cash flows). This indicates the amount of money available for debt payments and investment. For farm businesses that do not make down payments or outright cash purchases of investment items, this number is the amount expected to be available to make debt payments in an average future year if no additional changes are made in the organization of the business.

Annual Machinery Investment is the average amount that will be invested in machinery in an average future year to maintain the base year machinery investment. Other asset items are maintained through the cash operating expenses. Land is maintained through annual purchases of fertilizer, lime and other crop inputs. Livestock inventories are maintained through the raised livestock, costs which are included in a number of cash expense items (feed, vet, etc.) or through purchased replacements. Building maintenance is included in cash expenses. New buildings are not included but farm business can continue with the existing buildings for a number of years if necessary.

Although machinery repairs allow for some maintenance of the existing machinery inventory, practically all farms will find it necessary to purchase some machinery every year in order to maintain the machinery complement in working order. Annual machinery investment comes from Worksheet 2.A., question 1. The model either (1) uses line 1.A. directly or (2) calculates the annual machinery investment by dividing the total base year machinery investment by the average number of years that machinery remains on the farm (age at time of trade-in) and multiplying the result by the percent that the boot price paid for machinery is of the purchase value ($1 - \text{the percent that the trade-in value of an item is of the cost of its replacement}$).

Principal Refinanced Annually is the amount of intermediate term debt that can be refinanced each year with the principal that is reborrowed through the refinancing being used to buy replacement machinery. This number is taken directly from Worksheet 2.A., question 2.

Percent Repaid each Year is the percent of the principal that will be repaid during the first year of loan and, thus, can be reborrowed each year. This is calculated from the refinancing terms listed on Worksheet 2.A., question 2. The interest rate and number of years over which the loans would be refinanced, are used to calculate the amount of principal that would be repaid on a loan assuming monthly payments. This amount of

principal is expressed as a percent of the original balance and rounded to the nearest whole percent.

Amount that can be Reborrowed is the amount of the "principal that can be refinanced annually" from above that will be repaid, and thus, can be reborrowed, each year. This assumes that the loan is refinanced and that the principal paid during the year is reborrowed and used for machinery investment. This is calculated as the percent repaid each year multiplied by the principal refinanced. This amount represents the maximum amount of machinery investment that can be financed through the roll-over of intermediate term debt without the amount of intermediate term debt increasing and, thus, the amount of annual payments increasing.

Cash Machinery Investment is the amount of the expected annual investment in machinery that can not be financed through the roll-over of intermediate term debt.

Sustainable Debt Repayment Ability is the amount available for debt repayment in an average future year and, thus, represents the maximum level at which scheduled debt payments could be set and expect those payments to be met. It is calculated as the amount of cash generated by the business for debt repayment and investment minus the amount of machinery investment that must be made each year but can not be financed by the roll-over of existing intermediate term debt. Average annual expected future debt payments can not exceed this amount. If cash machinery investment (listed above) is zero, development of a loan program with payments which exceed the sustainable debt repayment ability can be expected to result in immediate debt repayment problems.

If cash machinery investment is positive, and the scheduled payments exceed the sustainable debt repayment ability, but are less than a total amount available for debt payments and investment, debt repayment problems may be avoided during the first year or year's of the investment. However, as machinery is replaced and funds borrowed for that replacement, debt payments can be expected to increase over time and will ultimately increase to levels that will exceed the amount available for debt payments and investment resulting in cash flow problem. Sustainable debt repayment ability should exceed planned debt payments by enough to cover (1) possible changes in interest rates, (2) year-to-year variability in farm income, (3) any misestimation of cash flows, and (4) other unexpected occurrences.

Planned Year Debt Repayment Ability

This table is printed if the debt information is entered in Section III of the input. This table indicates the amount by which the funds available for debt payments exceed or are less than the scheduled debt payments for the planned year. This differs from the sustainable debt repayment ability table in that it relates specifically to the planned year rather than an average future year.

Net Farm Income is calculated from cash farm income and cash farm expenses taken directly from the estimated cash flows for the planned year.

Capital Assets Sales comes from Worksheet 1.F. and represents the cash income that will be generated in the planned year through the sale of capital assets. These funds will be available to make payments during the planned year. However, similar income can not be expected to occur in future years. In most cases, capital assets sales represent an unusual or one time only source of cash.

Nonfarm Income comes from the income section of the planned year estimated cash flows.

Family Living comes from the expense section of the planned year estimated cash flows.

Available for Debt Payments and Investment is calculated from the above listed items. This represents the amount of cash available to make debt payments and investments during the planned year (only).

Funds to be Borrowed is the amount of money (principal) borrowed during the planned year. The data come from the "amount borrowed" columns from Worksheet 3.C. and 3.D. Borrowed funds represent cash flows into the business from outside sources.

Scheduled Debt Payments for Planned Year is the total regular debt payments to be made in the planned year on the debts entered on Worksheets 3.A., 3.B., 3.C. and 3.D. This represents the total principal and interest to be repaid through regular debt payments by the business during the planned year.

Additional Debt Payments is the amount of principal paid ahead of schedule. Early repayment could result either from paying off a loan to make use of excess cash flow or from refinancing. The regular payments to be made on any loan that is repaid early are included under scheduled debt payments for the planned year.

Investments is the amount of money invested in land, buildings, machinery and livestock during the planned year (Worksheet 1.F.).

Excess Repayment Ability is the amount of funds available for debt payment in excess that needed for the debt payments scheduled for the planned year. It is calculated as the funds available for debt payments and investment (1) minus the debt payments to be made in the planned year, (2) plus funds to be borrowed, and (3) minus new investments. A negative number indicates that there are insufficient funds available to make all planned debt payments during the planned year. Either net additional funds will have to be borrowed, accounts payable will increase by this amount more than was planned, or a new plan will have to be developed.

Market Value Balance Sheet

The market value balance sheet presents proforma balance sheets for the beginning of the planned year and the end of the planned year. The beginning of the planned year values for land, buildings and machinery, come from Worksheet 1.F. Livestock values come from Worksheet 1.B. Feed

and supplies come from Worksheet 1.D. Supplies, accounts receivable, cash and bank accounts, and marketable bonds and securities come from Worksheet 3.E. Farm Credit Stock comes from Worksheets 3.A. and 3.B. Beginning of year liabilities are taken from the January 1 planned year balance column of Worksheets 3.A. and 3.B. Loans are placed in categories based on the original term of the loan as follows:

<u>Loan Category</u>	<u>Original Term (years)</u>
Long term	Greater than 10 years
Intermediate term	10 years or less but greater than one year
Current debt and accounts payable	One year or less

Land (end of planned year) is the beginning of year value plus planned year investment minus planned year sales from Worksheet 1.F. multiplied by the expected change in the price of farm real estate from Worksheet 1.G.

Buildings (end of planned year) is the beginning of year value of buildings minus planned year sales, plus planned year investment, minus the lost capital percentage multiplied by the planned year investment, minus building depreciation, all multiplied by the expected change in the price of land and building repairs from Worksheet 1.G.

For each Livestock category the end of year value is calculated by determining the beginning of year value per head: the January 1 value divided by the January 1 number. That value is adjusted by the expected change in prices from Worksheet 1.G; cow prices are adjusted by the change in the price of milk cows, other livestock are adjusted by the change in value of dairy youngstock. The adjusted price is then multiplied by the number of animals in each category that are expected to be in the herd on December 31 of the planned year (Worksheet 1.B.). Total value of livestock is the sum of the values for the four categories.

Feed and Supplies (end of planned year) comes from two sources. Feed and crop inventory quantities come from Worksheet 1.D. and are valued at the end of year price per unit from Worksheet 1.C. The supplies inventory comes from the December 31 value entered on Worksheet 3.E.

Accounts Receivable (end of planned year) is taken from the December 31 value entered on Worksheet 3.E.

Cash and Bank Accounts (end of planned year) are taken from the December 31 value entered on Worksheet 3.E.

Marketable Bonds and Securities (end of planned year) is taken from the end of year value entered on Worksheet 3.E.

Farm Credit Stock (end of planned year) is the total value of stock outstanding on Farm Credit System loans with end-of-period cancellation. The value is the same as the beginning of year value unless a loan has been paid off. For loans that are paid off, the stock is used to make the final payment(s).

Long Term Liabilities (end of planned year) includes the remaining balance of all loans listed on Worksheets 3.A.-3.E. with an original term greater than 10 years. The end of year balance is calculated as the beginning of year balance, or amount borrowed for new loans, minus the principal paid on the loan.

Intermediate Term Liabilities (end of planned year) includes all loans listed on Worksheets 3.A.-3.D. with an original term greater than one year but less than, or equal to, 10 years. The end of year value is the beginning loan balance for each individual loan minus the amount of principal paid during the year.

Current Debt and Accounts Payable (end of planned year) include all loans listed on Worksheets 3.A.-3.D. with a term of one year or less. Accounts payable are entered with a term of zero (blank). If an account payable is entered with no payment, but with an interest rate, the end of year balance will be increased by the accumulated interest that has been unpaid. If no interest rate is entered the end of year value will equal the beginning of year amount.

Net Worth is the total assets minus total liabilities.

Percent Equity is net worth expressed as a percent of total assets.

A Detailed Review of the Calculation Procedure for Regular Loans and Accounts Payable

The values calculated for each loan include the end of year balance, end of year stock value and the total debt payments made on the loan during the planned year. Although only end of year balances and total payments are projected, the procedure allows for up to 12 payments per year.

End of Year Balance. If the input designates that the loan will be paid in full during the year, the ending balance is zero. If there is a beginning balance, but no scheduled payments will be made, as in the case of accounts payable, the balance at the end of the year will be the beginning balance plus the beginning balance multiplied by the interest rate (in decimal form). If payments are made, the ending balance will be the present value of the remaining payments (payments remaining at the beginning of the year less the number of payments made during the planned year) discounted at the interest rate on the loan.

The number of payments remaining at the beginning of the year are calculated as:

$$\text{Payments remaining} = \frac{\ln X}{\ln Y}$$

where, $X = \frac{\text{Payment amount}}{\text{Payment amount} - (\text{balance} \times \frac{\text{interest rate}}{\text{no. payments/yr}})}$

$$Y - 1 + = \frac{\text{Interest rate}}{\text{No. of payments per year}}$$

and L_n = Natural log

Number of payments made during the year is the minimum of the payments scheduled during the planned year or the total payments remaining.

The End of Year Stock Value is identical to the beginning of year value unless the loan is paid off during the year. If a loan is paid off during the year, the stock value is zero.

Since the stock outstanding on a Farm Credit service loan is used to make the final payment(s), the procedure listed above for calculating end of year balance may include loans that are paid off with the stock balance resulting in incorrect loan balances and overestimation of payments. To determine whether a loan is repaid with the stock the model calculates the end balance less the stock value. If the input designates that the loan will be paid in full during the year, the end balance less stock will be zero. Otherwise it will be the end of year balance minus the end of period cancellation stock value. If the end balance less stock is negative, the loan will be paid off during the planned year, the end of year stock balance and the end of year loan balance are both zero and the computer calculates the principal overpayment that would occur if all scheduled payments were made. To determine the number of excess payments (or fraction of payments) that would be made, the $\ln X / \ln Y$, listed above, formula is used. In this case,

$$X = \frac{\text{Payment amount}}{\text{Payment amount} - (\text{excess prin. payment}) \text{ interest rate}}$$

The excess principal payment is the amount of principal that would have been paid through regular payments that will, in fact, be covered by the value of the stock. This excess is mathematically calculated as the negative of the result of subtracting the stock amount from the end balance. Conceptually it is the stock amount minus end of year balance. The amount of overpayment is the calculated number of excess payments times the payment.

Total Debt Payments If a loan is to be paid in full during the year, the number of scheduled payments to be made if the loan were allowed to continue for its complete term is calculated.

$$\text{The number of payments made (N)} = \frac{M - (L - 12)}{12/P}$$

Where: M = number of the month loan is paid in full
 L = number of the month the last payment was made
 P = number of payments per year

This number is rounded down to the nearest integer. The number of months between the last scheduled payment and the month the loan will be paid in full is then calculated as follows:

$$\text{Months} = M - N (12/P) + L-12$$

This will indicate the number of months of interest that will accrue between the last scheduled payment and the date the loan is paid in full.

The payment required to pay the loan in full is calculated as the present value of the remaining balance immediately after the last scheduled payment, plus interest on that present value for the number of months between the last scheduled payments and the month it will be paid in full, minus the end-of-period stock value.

A Detailed Review of the Calculation Procedures for Milk Check Assignments

The procedures for determining the end of year balance, end of year stock value and total debt payments for loans paid through milk assignments are basically the same as used for regular loans and accounts payable, with variations to allow for the fact that (1) the assigned percentage of the milk check may not be sufficient to meet the interest payments, (2) total annual amount received on the assignment must be arbitrarily divided by 12 to get the monthly payments, and (3) the assigned amount must be divided between loans.

First, tentative interest is calculated as the beginning balance times the interest rate. If the amount available from the assignment is greater than the tentative interest, the average monthly payment is calculated as explained below and the calculations proceed much the same as they do for regular loans.

If more than one loan is included in the assignment, and the balance remaining after the interest is paid is apportioned to each loan, the average payment to each loan is calculated as:

$$\text{Payment} = (A-I) P + IL$$

where: A = The amount available from this assignment
 I = The tentative interest on all loans under this assignment
 P = The percentage of the balance assigned to this loan
 IL = The tentative interest on this loan

If scheduled payments are to be made on a multiple loan assignment, the scheduled payments are made on all loans except the loan of lowest priority, which will receive as a payment any surplus remaining after the higher priority loans are serviced. If there is a shortfall, this will be added to the principal plus any interest due on the lowest priority loan.

For any loan where the payments are less than the tentative interest due, the end of year balance is the beginning principal plus the future

value (as of year end) of any deficit in interest payments (tentative interest minus amount available). The future value formula incorporated in LOTUS requires the payment (total deficit interest, which equals amount available minus tentative interest) divided by 12, the interest rate and the number of payments (12 since milk assignment payments are made monthly and the loan will definitely not be paid off during the year if the payment is less than the interest). Since the deficit is algebraically negative, the future value will be negative, thus, the negative of its value is used.

The end balance of each loan is assigned to its proper category of short, intermediate or long term by the input data (original term in years).

New regular loans and new milk check assignments are handled the same as the existing regular loans and existing milk check assignments. There are no provisions for paying new milk check assignment loans in full. Scheduled payments on new loans are not entered since the program will compute the payments. The number of payments to be made during the year are calculated from the month the loan is made and the number of payments per year.

Proforma Income Statement

The planned year income statement is a proforma income statement covering the planned year. The income and expenses are those generated in developing the cash flow.

Revenue items including milk sales, cash sales of dairy livestock (calf sales and cattle sales), cash sales of feed and crops (crop sales) and other farm receipts are taken from the estimated cash flow. Changes in livestock inventory and accounts receivable come directly from the difference between the beginning and end of year values from the market value balance sheet. Feed and crop inventory change comes from the beginning and end of year crop inventories (Worksheet 1.C. and 1.D.).

Expense items including cash operating expenses, replacement livestock purchases and feed purchased, all come from the estimated cash flows. Investment livestock purchases come from Worksheet 1.F. and represent expansion livestock investment. Change in supplies inventory comes from Worksheet 3.E. and is the difference between the beginning and end of year inventory values. Depreciation on machinery and equipment, as well as land and buildings, come from Worksheet 1.F. and represents the depreciation expected to be taken in the planned year. Total expense (excluding interest) includes all of the projected expenses listed above and represents the total expenses incurred in operating the business in the planned year except interest expense.

Income from Farm Operations is calculated as the gross receipts minus total expenses excluding interest and represents the net income generated by the business before considering the amount of debt. This is the return to operator labor, family labor, management and all capital (debt and equity).

Interest Expense represents the total interest to be paid by the business during the planned year. This is calculated from the loans input on Worksheets 3.A.-3.D.

Net Farm Income is calculated as the income from farm operations minus interest expense. Net farm income is the return to operator labor, family labor, equity capital and management. It includes the change in the value due to price (appreciation or decline in value) on crop and livestock inventories but excludes price change on real estate and machinery.

Net Farm Income (including all asset value change) is the net farm income plus the change in value of assets due to price changes (appreciation or decline in value) for buildings, land and machinery. The increase in building value is calculated as the end of year value minus net investment where net investment is the beginning of year value, plus purchases, minus lost capital, depreciation and building sales. Changes in the value of land and machinery are calculated in the same manner except that they require no lost capital calculation and land has no depreciation. The sales, investment and depreciation values come from Worksheet 1.F.

This measure of income is identical to net farm income above, except that it also includes change in asset value due to price on land, buildings and machinery. This represents the return from operating and owning the farm business for the year.

Financial Analysis

To assist the user in analyzing the financial performance during the planned year, a series of analysis measures are calculated. These measures are also calculated for the base year when sufficient base year data are available to do so.

Liquidity

Scheduled Debt Payments Per Cow is the per cow amount of debt payments scheduled for the planned year. It is calculated by dividing the scheduled debt payments for the planned year from the Planned Year Repayment Ability output by the planned year average number of cows from Worksheet 1.B.

Available for Debt Service Per Cow is the amount available per cow to service debt. It is calculated by dividing the amount Available for Debt Payments and Investment from the Planned Year Debt Repayment Ability output by the average number of cows from Worksheet 1.B.

Cash Flow Coverage Ratio is the ratio of the amount available for debt payments to the planned level of debt payments. The data come from the Planned Year Debt Repayment Ability output. The ratio is calculated as the Amount Available for Debt Payments and Investment divided by the Scheduled Debt Payments for the Planned Year.

Debt Payments as a Percent of Milk Sales indicates the proportion of the milk check that is committed to debt repayment. It is calculated by dividing the Scheduled Debt Payments for the Planned year from the planned

year Debt Repayment Ability output by the value of planned year milk sales from the Estimated Cash Flow Statement.

Debt Per Cow is the total debt from the balance sheet divided by the corresponding (beginning or end of year) number of cows from Worksheet 1.B.

Solvency

Leverage Ratio is the ratio of total liabilities to debt. It is calculated as the total liabilities divided by net worth. Data come from the balance sheet.

Percent Equity is net worth divided by total assets. Both come from the balance sheet.

Current and Intermediate Debt to Asset Ratio is the total current and intermediate liabilities divided by current and intermediate assets. All data come from the balance sheet. Current and intermediate assets are calculated by subtracting the value of land and buildings from the value of total assets.

Long Term Debt to Asset Ratio is the total long term liabilities divided by the value of land and buildings. All values come from the balance sheet.

Profitability

Return on Equity is the rate of return to equity capital including all income or loss due to changes in the value of all assets (appreciation or decline in value). Return to equity is calculated as the Net Farm Income (including all asset value change) from the income statement minus the estimated value of Operator and Family Labor and Management from Worksheet 3.E. If no value is entered on Worksheet 3.E. for the value of Operator and Family Labor and Management, an assumed value of \$9,000 plus five percent of adjusted gross receipts, where adjusted gross receipts is total farm income minus purchased feed-concentrates and replacement livestock (from the cash flow statement). The rate of return on equity is the return to equity divided by average net worth (average of beginning and end of year net worth from the market Value Balance Sheet).

Return on Investment is the return to equity from above plus interest paid (from the income statement). The rate of return on investment is the return on investment divided by average total assets (average of beginning and end of year total assets from the balance sheet).

Capital Efficiency

Capital Turnover indicates the number of years that it takes for gross receipts to equal the total investment in the farm. Gross receipts come the income statement. Average total assets is the average of the beginning and end of year total assets from the balance sheet.

Real Estate Investment Per Cow is the total value of land and buildings from the balance sheet divided by the number of cows from Worksheet 1.B. Calculations are made for both beginning of year values and end of year values.

Machinery Investment Per Cow is the total value of machinery and equipment from the balance sheet divided by the number of cows from Worksheet 1.B. Calculations are made for both beginning and end of year.

Total Assets Per Cow is the total assets from the balance sheet divided by number of cows from Worksheet 1.B. Calculations are made for both beginning and end of year.

Cost Control

Cost control factors are calculated for both the base year and the planned year.

Feed Bought Per Cow for the planned year is the total of the feed-concentrate expense and the feed-forage expense from the estimated cash flows divided by the average number of cows from Worksheet 1.B.

For the base year feed-concentrate and forage purchases come from Worksheet 1.A. and include cash expenditure plus change in accounts payable. Average number of cows comes from Worksheet 1.B.

Machinery Cost Per Cow is calculated by dividing total machinery costs by the average number of cows from Worksheet 1.B. Total machinery costs is the sum of (1) machine repairs, (2) auto expense, (3) fuel and oil (4) machine hire, (5) machinery depreciation (Worksheet 1.F.) and (6) interest on average machinery investment (from balance sheet) at five percent. All data come from the cash flow statement unless otherwise indicated.

Feed and Crop Expense Per Hundredweight of Milk is the total feed and crop expense divided by the hundredweight of milk. Feed and crop expense includes (1) feed-concentrate, (2) feed-forage, (3) fertilizer and lime, (4) seeds and plants, (5) chemicals and sprays, and (6) other crop expense. For the planned year the hundredweight of milk is calculated from data on Worksheet 1.B. and the expense items come from the cash flow statement. For the base year, the hundredweight of milk come from Worksheet 1.B. and the expenses include the cash amount and change in accounts payable from Worksheet 1.A. and the change in corresponding inventories from Worksheet 1.F.

Percent Feed is of Milk Receipts for the planned year is the total feed-concentrate and feed-forage expense divided by milk sales with all data coming from the estimated cash flow. Base year feed expense includes the cash expense for concentrate and forage plus changes in accounts payable. Milk receipts includes the cash receipts plus change in accounts receivable from Worksheet 1.A.

RUNNING THE COMPUTER PROGRAM

Once you have completed entering all the necessary data on the worksheets, you will be ready to run the model. The first step in using the model is to gain access to the LOTUS 123 spreadsheet. This is done in different ways, depending upon the type of computer you are using.

Note: Some computers have a [RETURN] key. Others have an [ENTER] key which serves the same function. Throughout this publication we will use the [ENTER] designation. If your computer has a [RETURN] key, use it whenever the directions indicate [ENTER].

1.0 IBM-PC (two floppy disks).

- 1.1 Insert DOS (2.0 version or higher) into the A drive (left).
- 1.2 Turn on the machine and wait. Enter date and time if requested.
- 1.3 When A> alone appears, take out the DOS disk.
- 1.4 Insert LOTUS 123 (version 2.01) system disk into the A drive.
- 1.5 Type [LOTUS], then press the [ENTER] key. The LOTUS cover page will appear on the screen. Press any key and wait.
- 1.6 You are now ready to use the cash flow analysis template.

2.0 IBM-PS/2 (Warren 160)

- 2.1 Make sure machine is turned on (computer and monitor).
- 2.2 If a menu of choices does not appear on the screen, type [MENU] and press [ENTER].
- 2.3 When the menu options are displayed, type the letter corresponding to LOTUS 123 (version 2.01) and press [ENTER].
- 2.4 The LOTUS 123 cover page will appear. Press [ENTER].
- 2.5 Copyright information will appear briefly on the screen. The LOTUS spreadsheet will then appear. Press [/] (slash).
- 2.6 Two lines of options (the LOTUS menu) will appear. The first line is: Worksheet, Range, Copy, Move, File, Print, Graph, Data, System, Quit. Enter your disk in the appropriate drive. Press [F], or move cursor to File and press [ENTER].
- 2.7 The options are now: Retrive, Save, Combine, Xtract, Erase, List, Import, Directory. Press [D], or move cursor to Directory and press [ENTER].

- 2.8 The first line will now read "Enter Current Directory": followed by "c:\lotus201" (or something similar to that). If you are using a 5 1/4 inch disk, enter [b:], and press [ENTER]. If you are using a 3 1/2 inch disk, enter [a:], and press [ENTER]. The LOTUS worksheet will reappear.

3.0 IBM-PCXT (others)

- 3.1 Procedure for accessing Lotus may differ between machines. If you do not know the procedure, obtain help.
- 3.2 When C> appears, and LOTUS 123 is on the hard disk, access is usually gained by typing [cd\LOTUS123] or [cd:LOTUS123], [ENTER] (LOTUS 123 is the name of the directory where LOTUS 123 is stored).
- 3.3 Then type [LOTUS] and press [ENTER].
- 3.4 The LOTUS cover page will appear. Insert the system disk and press [ENTER].
- 3.5 Copyright data will appear, press [ENTER].
- 3.6 The spreadsheet will finally appear.

4.0 Inserting the Cash Flow Analysis Disk

- 4.1 a. If you are using a two floppy disk drive computer, insert the FLOWS disk in the B drive.
- b. If you are using a single floppy disk drive, remove the LOTUS 123 system disk and insert the FLOWS disk.
- 4.2 From now on, all computers should work with the same procedure.

5.0 Getting Started

- 5.1 The first command you give the computer when using the flows model will be the file retrieve command. Be sure the flows diskette is inserted in the B drive (if using a two drive PC) or the appropriate floppy disk drive (if using a microcomputer with a hard disk). If you are not familiar with LOTUS 123, you should read section 8.0, Using LOTUS 123, before you continue with the program.
- 5.2 Press [/] (slash). Two lines of options will appear across the top of the screen. The cursor will highlight "Worksheet". Other options available are: Range, Copy, Move, File, Print, Graph, Data and Omit. Move the cursor to file and press [ENTER], or type [F]. The options listed now are: Retrieve, Save, Combine, Xtract, Erase, List, Import and Directory. Since the cursor is on Retrieve, you can either press [ENTER] or [R].

- 5.3 The first line will now read "enter name of file to retrieve:" Beneath that will be flows, highlighted by the cursor. You can now either type [FLOWS] and press [ENTER], or simply press [ENTER].
- 5.4 The menu indicator in the upper right corner of the screen will change to a flashing WAIT. It takes the flows file about two minutes to be retrieved (moved from the disk into the computer), so be patient.
- 5.5 When the flows file appears on the screen, you are ready to proceed with the program.
- 5.6 This whole series of commands can be accomplished by simply typing: [/FR], wait until the cursor highlights flows, then press [ENTER].

6.0 Operating the Program Using the Program Menus

- 6.1 It is possible, and for most people easiest, to enter all data, review the results, make decisions for output, save, print and exit the program using the menu system incorporated in the program. When the file is retrieved, a macro is automatically executed which starts you off by displaying the cover page. If directions displayed on the screen are followed and you stay within the menu controlled program, all data can be entered in proper sequence and in the correct cell.
- 6.2 After the cover is displayed, you are instructed to press [ENTER] to continue. Instructions are displayed for erasing existing data or continuing with the program. The first choice is to continue with the program. If you have made data entries for an analysis and did not complete the program, or you wish to change some entries, you should make no entry in the cell where the cursor is located. Press [ENTER] and the first screen for data entry will appear. If you are starting a new analysis, all existing data must be erased. The macro enables you to do this by one keystroke. Enter [1] in the cell where the cursor is located and press [ENTER]. It will take a few minutes for the macro to execute and then the first screen for data entry will appear on the screen. This corresponds with Worksheet 0.
- 6.3 The cursor will be located at the cell designated for the name of the operator of the farm for which the analysis is being prepared. Type the name and press [ENTER]. The name will be entered and the cursor will move to the cell for the base year (the year on which the projected flows are based). The cursor will automatically move to the next cell when data are entered in the highlighted cell and [ENTER] is pressed. Any system of numbering or naming may be used for the analysis identification. Just press [ENTER] if there is no identification used. The cursor will continue through the next column where the address and the name of the preparer are located.
- 6.4 After the preparer's name is entered, the cursor will move to the choices available for type of analysis and output. The choices are made by entering [1] in the appropriate cells. If any particular output is not desired, make no entry and press [ENTER]. When the

choice is made to print or not print the input data, press [ENTER] once more. This will invoke a macro which will copy some of the data just entered to other parts of the spreadsheet. This will only take a few seconds.

After the data are copied, a menu will appear at the top of the screen similar to the LOTUS command menu.

- 6.5 The menu that appears controls the macro that expedites operation of the program. There are seven choices available in the main menu. The first line displays the choices and the second line gives a brief description of the choice highlighted in the first line. Pressing the right arrow key will move the cursor from one choice to the next, and will display its function on the second line. Selection of a choice can be made by highlighting the choice and pressing [ENTER], or by simply pressing the first letter of the choice, (i.e., F for Flows). The structure of the menu system is shown on the following page. A description of the alternatives follows.

FLWS: Takes you to Worksheet 1.A. You get to Worksheets 1.B. through 1.I. by going to 1.A. and then pressing [ENTER] each time you are ready to move to the next worksheet. If you make an entry on a worksheet, move to another cell before pressing [ENTER] to move to the next worksheet.

CAPACITY: Takes you to Worksheet 2.A.

DEBTS: Takes you to Worksheet 3.A. You get to Worksheets 3.B. through 3.E. by going to 3.A. and then pressing [ENTER] each time you are ready to move to the next worksheet. If you make an entry on a worksheet, move to another cell before pressing [ENTER] to move to the next worksheet.

SAVE: Calculates the entire worksheet and then saves it on your disk.

PRINT: Takes you to the print options where you indicate the type of printer you have. The options include:

OKIDATA: Automatically prints output on Okidata printer.

EPSON: Automatically prints output on EPSON or IBM printer.

LASERJET: Automatically prints output on Hewlett Packard LaserJet Printer.

ANOTHER: Provides the information required from this program to develop the set-up string to print the report with another type of printer. Selecting this option takes you out of the program control macro.

MENU: Stops the printer selection and returns you to the main FLOW menu.

- QUIT:** Takes you out of the FLOWS program control macro and returns you to the ready mode.
- RESULTS:** Allows you to select the part of the results of the analysis that you want to view on the screen. Once you have viewed the selected results, press [ENTER] and the program will return to the menu. The alternatives are:
- CASH FLOW:** Cash flow for the planned year.
- DEBT:** Sustainable debt repayment ability.
- ABILITY:** Repayment ability for next year (not necessarily sustainable - correct only when planned year follows base year).
- BALANCE:** Proforma balance sheet.
- INCOME:** Proforma income statement.
- FINANCIAL:** Financial analysis chart.
- MENU:** Returns you to the main FLOWS menu.

Note: The first five statements can be viewed by going to any one of them and using the arrow keys to move to the others. They are located below each other in the order listed above. After the results have been viewed, press [ENTER] to return to the menu.

- NEXT:** Is used to take you to the next analysis or exit LOTUS. The options are:
- NEW:** Takes you to the very beginning of the program to start analysis of a new farm situation. If you save your existing program on your disk before using this, you can insert a new formatted floppy disk on which your new problem can be saved.
- REVISION:** Takes you back to Worksheet 0 to change the type of analysis being conducted (i.e., change from next year cash flow with proforma balance sheet and income statement to sustainable repayment ability for an average future year).
- QUIT:** Takes you out of the FLOWS program macro to ready mode (to use all regular LOTUS commands).
- EXIT:** To exit LOTUS. Use this when you have completed your analyses.
- MENU:** Return to main FLOWS menu.

Flows Menu Format

MAIN
Flows
Menu

Flows	Capacity	Debts	Save	Print	Results	Next
Enter data for cash flow (Worksheets 1.A-1.I)	Enter data for sustainable repayment ability (Worksheet 2.A)	Enter debt data for proforma balance sheet (Worksheets 3.A-3.E)	Calculate results and save on disk			
OKIDATA	EPSON	LASERJET	ANOTHER	MENU	QUIT	
Prints on Okidata printer	Prints on Epson or IBM printer	Prints on Hewlett Packard Laserjet Printer	Provides data for printing with other printers	Return to main FLOWS menu	Exit FLOWS control/program go to LOTUS ready mode	
CASH FLOW	DEBT	ABILITY	BALANCE	INCOME	FINANCIAL	MENU
View projected cash flow	View sustainable repayment ability	View next year repayment ability	View proforma balance sheet	View proforma income statement	View proforma financial ratios	Return to main FLOWS menu
NEW	REVISION	QUIT	EXIT	MENU		
new farm analysis (beginning of program)	change type of analysis or re-lable (Worksheet 0)	Exit FLOWS control program go to LOTUS ready mode	Exit FLOWS and LOTUS	Return to main FLOWS menu		

NOTE: This menu can always be accessed by (1) pressing [CONTROL] and [BREAK] simultaneously, and then (2) pressing [ALT] and [M] simultaneously.

- 6.6 While operating the program, the mode indicator in the upper right hand corner of the screen and the status indicators at the bottom of the screen indicate the manner in which the computer is operating. Actions you can take depend on these indicators. Some of the modes and status indicators you will encounter are indicated below.

MENU: Select from the menu the part of the program to be used.

READY: Enter or correct data under control of input macro, or any LOTUS action (you can go to any part of the worksheet using the F5 key from this mode).

CMD: The program is being controlled by a macro. Usually this will mean you being controlled by the FLOWS menu program - but not always.

CALC: You have made entries since the worksheet was calculated. You need to use SAVE from the FLOWS input menu or go to the last worksheet in any one of the three sections (1.I., 2.A. or 3.E.) and press [ENTER].

Note: If you find yourself outside of the menu controlled program, you can return to the main FLOWS menu by pressing [CONTROL] and [BREAK] simultaneously and then pressing [ALT] and [M] simultaneously.

- 6.7 The first logical choice from this menu would be Flows. This will locate you in Section 1 for the input of the base year data. Press [F] to make this choice. Worksheet 1.A. will appear on the screen and the cursor will be located at base year milk sales. Each cell capable of accepting an entry can be accessed by pressing the right arrow key. Type the entry, press the right arrow key, and the cursor will move to the next unprotected cell (cell in which data can be entered) on that line. When all the unprotected cells on that line in section 1.A. have been accessed, the cursor will move to the left cell in the next line. If no entries are to be made in changes in accounts receivable/payable, adjustments to base year, or planned year deviations, the down arrow key can be used to reach the next line. If no entry is made in a cell, use arrow keys to move to other cells. Use of the ENTER key should only be made when there is an entry in the cell. If the return key is used and no entry is made in a cell, the macro will move you from that worksheet to the next worksheet. If the right arrow key is used for data entry, each unprotected cell will be accessed in order and when all cells have the data (or lack of data) entered, the cursor will move to the first cell of the worksheet (Worksheet 1.A. Base Year Milk Sales). At this point, make no entry and press [ENTER]. Worksheet 1.A. will be exited and Worksheet 1.B. (Livestock Data) will appear on the screen. This is a small worksheet, and again, by using only the right arrow key for data entry, all cells capable of receiving data will be accessed. When all are entered, the cursor will return to the first unprotected cell of the worksheet. Make no entry and press [ENTER].

Worksheet 1.C. Crop Data, will appear on the screen. [ENTER] may be pressed at any time after all the data are entered to access the next

worksheet. Using the right arrow key until the cursor returns to the first unprotected cell of the worksheet insures that all cells are touched that can receive an entry. If you know that all the data for a worksheet has been entered, you can move to a cell which will receive no entry and press [ENTER]. You will go immediately to the next worksheet.

All of the worksheets (1.A. through 1.I) of Section I can be reached in this manner. Worksheets 1.G., 1.H. and 1.I. are not erased by the macro. They are expected price changes, relative cost factors and feed use factors for different levels of milk production. These items should be examined by the operator and changed if more accurate information is available. When the data are entered for Worksheet 1.I. and [ENTER] is pressed, the spreadsheet will calculate. The mode indicator in the upper right corner of the screen will flash a "wait" signal while the calculations are taking place. When the calculations are finished, the main menu will appear again.

- 6.8 CAPACITY is the next choice listed after FLOWS in the menu. This corresponds to Section 2 of the worksheets. It is only one screen and data are entered as in Section 1. When all data are entered and [ENTER] is pressed, the spreadsheet calculates again and you will be returned to the menu.
- 6.9 Menu entry DEBTS corresponds to Section 3 of the worksheets and completes all data entry possible. When Worksheet 3.E. is completed, the spreadsheet calculates and you are returned to the main menu. At this time, it might be wise to scan through the worksheets again to make sure all the data are entered correctly. The three sections can be accessed through the menu as they were for data entry.
- 6.10 If an entry was mistakenly made in a cell that should have no entry, you have three alternatives:
 1. If the computer expects a number, place the cursor on the cell, enter a zero and press [ENTER].
 2. If the computer expects words (a label), place the cursor on the cell, press the space bar and press [ENTER].
 3. If you want nothing to appear in the cell, it must be erased.
 - a) Press [CONTROL] and [BREAK] simultaneously until the mode indicator (upper right hand corner of screen) says READY.
 - b) Move cursor to the cell (or one of the cells) to be erased.
 - c) Press [/RE], or press [/], move cursor to RANGE, press [ENTER], move cursor to ERASE, press [ENTER].
 - d) If more than one cell is to be erased, expand the highlighted area by using the arrow keys. Press [ENTER]. The entire highlighted area will be erased.

6.11 An inappropriate entry during the data input process can cause the model to react in undesirable ways. Some of these are that the system displays the ready mode, headings from another worksheet remain on the screen or the cursor will not move to cells desired. The first step is to disengage the macro controlling data input. Pressing [CONTROL] and [BREAK] simultaneously will disengage this, or any, macro. If double headings appear, the Worksheet Titles command is in effect (this is used in the macros). To clear the screen, press [/] (slash), [W] (worksheet), [T] (titles), [C] (clear). To continue with regular program use activate the menu macro again by pressing [ALT] and [M] simultaneously. The menu will appear. Select the section of the worksheet you want to access: FLOWS = Section 1, CAPACITY = Section 2, DEBTS = Section 3. Once the section is accessed, press [ENTER] until the worksheet desired appears.

6.12 Once the data are entered for all the sections required for the analyses to be conducted, it is advisable to review the output on the screen before printing the output. The output can be accessed directly by selecting RESULTS on the main FLOWS menu and then selecting the part of the results you want to look at from the sub-menu.

All of the above output forms, except the financial analysis chart, follow each other (in the order listed on the sub-menu) on the computer listing. Thus, you can look at most of the output by using the up and down cursor keys or the page up or page down keys after moving to one form.

After you have reviewed the results, press [ENTER] to return to the main FLOWS menu. If the results are not acceptable select FLOWS, CAPACITY or DEBTS to make the changes desired in the input. Repeat the process described above until acceptable results are obtained.

6.13 When all the data are entered correctly and acceptable results are obtained, save the data by pressing [S], when the menu is visible. This subroutine will calculate the spreadsheet again and save the spreadsheet on your disk. This operation takes several minutes.

6.14 When you are ready to print the results, press [P] (when the menu is visible) and you will be moved to print sub-menu. There are six choices on this menu, listed on the top line. The second line gives a description of the selections highlighted on the top line. The first three choices are for the type of printer to which your computer is connected. Pressing [O], [E] or [L] will print the desired output designated on Worksheet 0. If another type of printer other than the three listed, (Okidata, Epson or IBM or HP LaserJet) is being used, pressing [A] (another) will provide instructions for doing so. Pressing [M] (main menu) will return you to the main FLOWS menu. Pressing [Q] (quit) will exit the menu controlled program and return you to the LOTUS ready mode.

6.15 Once the current analysis is completed and printed, you select NEXT from the main FLOWS menu.

1. If you now want to do a different analysis for the same farm, for example switch from analyzing next year to conducting an analysis of an average future year, you select REVISION. This will take you to Worksheet 0 to indicate the type of analysis to be conducted.
 2. If you want to start the analysis of a new farm situation, select NEW. This will take you to the very beginning of the program so that you can erase the data for the current problem before starting. Now would be a good time to remove the disk with the saved data for the farm just analyzed and replace with a formatted disk, on which the program has been copied, for saving the new situation. *Note: If the program has not been saved on the new disk; a) select QUIT from the menu, b) press [/FS], c) press [ALT] and [M] simultaneously, and d) select NEXT followed by NEW from the menu.*
 3. If you want to exit the FLOWS control program (macro), select QUIT. This will allow you to use all regular LOTUS commands.
 4. If you are through using FLOWS and LOTUS, select EXIT. This should be used when you have completed your analysis, are quitting for the day or the computer will be used for other purposes before you return to your analysis.
- 6.16 The program can be operated without using the menu and normal input macro which automatically moves the cursor to the next cell (officially referred to as a range input controlled macro) as described above. It is recommended, however, that at least Worksheet 0 be completed before disengaging the macro. This will insure that the data are erased (if a new analysis is being initiated) and that certain information is being copied to other parts of the spreadsheet correctly. As mentioned before, this, and any, macro can be disengaged by pressing [CONTROL] and [BREAK] simultaneously. After exiting from the macro, input and use of the program can be controlled by normal LOTUS commands.

7.0 Flows Macros

If you are familiar with LOTUS and prefer not to use the menu command structure, all of the macros to perform tasks such as saving, printing and erasing can be invoked without the macro menu being engaged. These macros should be invoked only when the mode indicator reads READY. If a macro is in effect (mode indicator says something other than Ready), CONTROL and BREAK will put you in the ready mode. When you wish to view the HELP screens, and a macro is in effect, always press CONTROL and BREAK before pressing ALT and H. The macros used are:

ALT 0 This macro returns you to the cover screen

This is the same as ALT 0 (zero), which is automatically executed when the Flows file is retrieved. If the ALT 0 (zero) macro is

disengaged and you wish to execute it again, it can be invoked by pressing [ALT] and [O] (capital or lower case) at the same time.

ALT E Erases all existing data from previous analyses.

ALT H Accesses the HELP screens.

ALT S Calculates and saves the spreadsheet.

ALT P Prints data indicated in Worksheet 0, on an Okidata printer.

ALT R Prints on IBM or Epson printer.

ALT L Prints on Hewlett Packard LaserJet printer.

There are several other macros in the program, but they are integrated into the major print macros listed above. Their use is governed by the entries made in Worksheet 0 where the selection of type of analysis is made.

8.0 Using LOTUS 123

- 8.1 If you are not familiar with LOTUS 123, the following commands and functions will help you operate the model.
- 8.2 LOTUS consists of 254 columns and 2,048 rows, or a total of 520,192 cells. Twenty rows and usually seven columns are visible on the screen at one time. Since the column widths can be adjusted to the needs of the model, this can vary.
- 8.3 Three types of entries can be made in any cell; a value (number), a formula, or a label (text). This model uses all three types of entries, but as a user you will be concerned mainly with numbers. You will create labels only on Worksheet 0 where you will enter the farm owner(s) name, address and the years covered by the cash flow, and on the debt worksheets where you enter lender names. The rest of the work in completing the program will be entirely numbers or values.
- 8.4 Data are entered in a cell by placing the cursor on the cell and typing the desired entry. At the top of the screen, the cell address is displayed, and as you type an entry, the entry will appear below the address. When you press return (or enter), the data will be entered in the cell.
- 8.5 Movement of the cursor (the cursor is the highlighted cell on the screen) is accomplished by using the arrow keys located at the right side of the keyboard. Pressing an arrow key moves the cursor one cell in the direction of the arrow. Holding the key down moves the cursor an indefinite number of cells.
- 8.6 In addition, there are three other keys which will move the cursor. [HOME] will move the cursor from any cell in the spreadsheet to the

beginning of the spreadsheet, or cell A1. [PAGE UP] or [PAGE DOWN] will move the cursor 20 rows vertically.

- 8.7 If a typing error or the wrong entry is made, it can be corrected before it is entered in the cell (return is pressed), by using the backspace key. Pressing the backspace key will erase the character to the left of the pointer. If incorrect data have been entered in the cell, the error can be corrected by placing the cursor on the cell and typing the correct entry and pressing [ENTER].

8.8 Function Keys

Sections 8.8 through 8.14 are for those who prefer to use regular LOTUS commands rather than the menu structure.

There are 10 function keys located on the keyboard. They are located either in two vertical rows at the left side of the keyboard, or in a single horizontal row at the top of the keyboard. They are designated F1 through F10. These keys can not be used while the FLOWS menu is being used. Press [CONTROL] and [BREAK] simultaneously or select NEXT and QUIT from the menu before attempting to use them. You will be concerned with only four of these keys when operating this model.

- F1. This is the help key. Pressing this key gains access to the help menu. Instructions (are given) on how to use the help menu will appear on the screen.
- F2. This is the edit key, when it is pressed, the spreadsheet goes into the edit mode. The contents of the cell on which the cursor is located can be changed one, or more, characters at a time. The pointer will be located at the end of the entry and can be moved to any position by using the left or right arrow keys. The HOME key will move the pointer to the beginning of the entry. Characters can be added to the entry by placing the pointer to the right of the desired additions and typing the character. Characters can be removed by either the backspace key or the delete key. The backspace key will remove the character to the left of the pointer and the delete key will remove the character directly above the pointer. Pressing [ENTER] restores you to the ready (normal position) mode.
- F5. There is another way to move rapidly around the spreadsheet. It is the GO TO function. By pressing [F5], [A CELL ADDRESS OR CELL NAME], and [ENTER], you will immediately move the cursor to that address. Each worksheet has a cell address at the top of it that indicates the location of the spreadsheet which corresponds to it. This is the upper left hand cell address of the worksheet. By pressing [F5], [THE ADDRESS], and [ENTER], you can move to that area. You can also move to a worksheet by pressing [F5], [THE WORKSHEET NUMBER], [ENTER]. The worksheet number for Worksheet 0 (zero) is WSO (zero).
- F9. This key calculates the spreadsheet. The flows model is in the manual calculation mode since it takes some time to calculate. If it were in the automatic mode, the entire spreadsheet would calculate each time an entry was made. In the manual mode, the spreadsheet will

calculate only when it is ordered to. All entries can be made in the model before it is necessary to calculate, but it can be done at any time by pressing [F9]. You will spend less time waiting for the model to calculate if you make all entries for a section before calculating.

8.9 Commands

- 8.10 Many of the operations in the flows model are executed by commands. To gain access to the command menu, press slash [/]. The command menu will appear at the top of the screen. The top line will display the options available, and the second line will display the sub-options available under the option highlighted in the first row. The options can be selected by two methods. The cursor can be moved to the selection and the [ENTER] key pressed, or the first letter (initial) of the option can be typed. The second method is much faster, but there is a greater chance of making an error. If an error is made, or you change your mind, pressing the [ESC] key will return you to the previous position. Repeated pressing of the escape key will return you to the ready mode.
- 8.11 File Save. This command will be used if you wish to save the data you have entered before you complete entering all of the data and the running of the model is completed. If you must leave the computer, it is always a good idea to save your data. It is also wise to save the data periodically, even if you are working at the computer. The simple command to save the data is: [/FS], [ENTER], [R] (replace). The [/] accesses the command menu; [F] selects the file option; [S] selects the save option; [ENTER] verifies the name of the file to save (which is flows); [R] instructs the computer to replace the data already existing on the file with the data you have entered.
- 8.12 Quit. This is used to exit the LOTUS spreadsheets and should be executed when you are stopping work for a period of time. The commands are: [/QY]. [/] accesses the command menu; [Q] selects the quit option; and [Y] (yes) verifies your intent to quit. The main LOTUS menu will appear on the screen. Press [EY]. [E] selects the exit option and [Y] verifies your intent to exit the LOTUS system.
- 8.13 Titles. One other command will be useful while operating the model, the titles option. This enables you to keep either horizontal titles or vertical titles, or both, visible on the screen. Since some of the screens are larger than can be viewed on the monitor, it is helpful to be able to see the headings while entering data. To use the command, place the cursor to the right of vertical titles you want to be able to view at all times, and below the horizontal titles. Press [/WTB]. If you want only horizontal titles, press [/WTH]. Only vertical, [/WTV]. Before you move to another screen, be sure to clear this command by pressing [/WTC].
- 8.14 Range Erase. Another command which may be useful, but should be used with caution, is the Range Erase command. If an entry is made incorrectly, or in the wrong cell, the entry can be erased by pressing [/RE], entering the range to erase, [ENTER]. The range can

be one cell or up to the entire spreadsheet. The range can be designated by placing the cursor at the beginning of the range to be erased (or one cell) and expanding to the desired range by using the arrow keys. The range to be erased will be highlighted. Another method of defining the range is to type in the range when the screen asks for the "range to erase". The address of the cursor will be named when this appears, but any range can be entered. The range should be designated by the address of the upper left cell, two periods, and the address of the lower right cell. For example; A10..C20. When return is pressed, all cell contents between and including these cells, will be erased.

9.0 Making Backup Copies of the Disk

Backup copies of all the disks should be made. This can be done using DOS by following the procedure for copying disks. If you are working on several analyses, and wish to save the data on disks, a copy of flows should be prepared for each separate analysis. Once a hard copy of the completed analysis is made, the data on flows can be erased by invoking the [ALT E] macro.

If a hard copy of the input is not made, the information necessary for a complete analysis can be kept on the flows disk by maintaining a separate disk for each situation. Each disk should be labeled to avoid confusion.

- 9.1 Copies can also be made while using LOTUS. Retrieve flows. Remove the disk and replace with a formatted blank disk. Press [/FS], [ENTER].

10.0 Making a New Copy of Flows from Hard Disk

Flows should be loaded onto the hard disk of your computer, if you have one. If, for some reason, you damage the flows disk and need to make a new copy from the hard disk, this is the procedure to follow.

- 10.1 Retrieve the flows file from the hard disk by entering [/FR], [C:FLWS], [ENTER].
- 10.3 Insert a formatted disk in drive A and press [/FS A:FLWS], [ENTER]. It will take several minutes to save.

EXAMPLE OUTPUT
CLEMENTS FARM

Next (or Transition) Year

The following pages present an example of the printouts generated by the FLOWS Model. The printouts are for the Clements Farm situation for which data were entered on the example input sheets in the first section of this publication where the input is discussed. Pages 70 to 80 are a printout of the data input for Sections 1 and 3. The initial problem analyzed for the Clements was a cash flow analysis for the coming year. Pages 81 to 85 present the output from this analysis.

The Clement's also needed an analysis of the long-run financial feasibility of their proposed investment. The discussion of this analysis starts on page 86.

ANNUAL CASH FLOW
and
REPAYMENT ABILITY MODEL

Developed by

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Programmed by

David B. Cook
(Version 2.1)

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Prepared for

Clyde & Clint Clements
Clements Road
Chagrin
N. Y. 99999

Projection for the Year 1988

Based on the records of 1987

Analysis Identification Expand to 150 cows

Prepared by I.D. Consultant

Prepared for Clyde & Clint Clements

1988

Worksheet 1A. Base Year Flows

Item	Base Year Value	Change in Accounts Rec/Pay	Adjustments to Base Year		Planned Year Deviations	
			\$	%	\$	%
Income:						
Milk Sales	193351					
Calf Sales	3524					
Cattle Sales	12158					
Crop Sales						
Other Farm Rcpts					3000	
Non Farm Income						
 Amount of dairy cattle sales resulting from reduction in herd size during base year.....						
 Increase in raised cattle sales from reduced rate of increase in herd size in planned year.....						
 Expenses:						
Labor	28707				-9441	
Feed, Concentrate	56530	-4560				
Feed, Forage	2820					
Breeding Fees	4184					-20
Veterinary-Medicine	8861					
Replacement Lvstk	1629					
Other Lvstk Exp	8362				2000	
Machine Repair	9491				4000	
Auto Expense	833					
Fuel & Oil	2106					
Machine Hire	869					
Lime & Fertilizer	8868		1000			
Seeds & Plants	3437					
Chemicals & Sprays	2554					
Other Crop Exp	449					
Rent	3912					
Land & Bldg Repair	3585					
Insurance	2760					
Taxes	3688					
Electricity	2612					
Other Utilities	422					
Marketing	11500					
Miscellaneous	1358					
Family Living Exp	15000				9000	

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Worksheet 1B. Livestock Data

Planned Year Livestock Inventory Data

	Number January 1	Value January 1	Number December 31
Cows	102	89250	150
Heifers (Bred)	26	13000	38
Heifers (Open)	21	9000	25
Calves (Under 6mos.)	15	4000	40

	Base Year	Planned Year
Number of Cows (average)	102	126
Bred Heifers (average)	26	32
Open Heifers (average)	20	23
Calves under 6 months (average)	16	27
Pounds of Milk Sold	1504915	
Per cent Change in Production per Cow		1.00
Per cent Change in Feed Use per Cow		2.00
Change in Milk Prices		-0.75
Per Cwt Marketing Charge (Assessment)	0.49	0.39

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1988

Worksheet 1C. Crop Data

Crop	Crop Acres		Crop Yields		End of
	Base Year	Planned Year	Base Year	Planned Year	Planned Year Price/unit
Corn Silage (Tons)	80	105	17.0	18.3	20.00
Corn Grain (bu)					
High Moisture Corn					
Hay - dry (tons)	94	105	2.1	2.8	60.00
Hay Crop Silage (T)	63	72	4.8	6.3	27.00
Oats (bu)					
Wheat (bu)					
Other Grain (bu)					
Other Forage (T)					
Non Feed Crop					

Worksheet 1D. Base Year Crop Use

Crop	Base Year	Base Year	Base Year	Base Year	Planned Year	Planned Year
	Beginning Inventory	Purchases	Sales	Ending Inventory	Beginning Inventory	Ending Inventory

Concentrates:

Beginning Plnd Yr Inventories same as End Base Yr.....1=Yes..... 1

Ending Plnd Yr Inventories same as End Base Yr.....1=Yes, 2=Not Preset.....

Corn Grain (bu)

Price/bu

HM Corn (t)

Price/ton

Oats (bu)

Price/bu

Wheat (bu)

Price/bu

Other Grain (bu)

Price/bu

Purchased Concntr

\$ Value

885

1135

1300

Forage:

Beginning Plnd Yr Inventories same as End Base Yr.....1=Yes..... 1

Ending Plnd Yr Inventories same as End Base Yr.....1=Yes, 2=Not Preset.....

Hay (t)

56

47

186

200

Price/ton

70.00

60.00

65.00

60.00

Haycrop Silage (t)

330

187

225

Price/ton

27.00

27.00

27.00

Corn Silage (t)

558

552

1200

Price/ton

20.00

20.00

20.00

Other Forage (t)

Price/ton

Non Feed Crop \$

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1988

Worksheet 1E. Planned Year Crop Purchases and Sales

Crop	Volume of Purchases	Price per Unit	Volume of Sales	Price per Unit	Excess Prod Used as: Feed=0, Sales=1
<hr/>					
Concentrates:					
Corn Grain (bu)					
HM Corn (t)					
Oats (bu)					
Wheat (bu)					
Other Grain (bu)					
Forages:					
Hay (t)					
Hay Crop Silage (t)					
Corn Silage (t)	100	20.00			
Other Forage (t)					
Non Feed Crop					

Worksheet 1F. Farm Inventories

	January 1 Planned Year	Planned Year Sales	Planned Year Investment	Plnd Yr Depreciation
Land	126500		36000	
Buildings	83500		65000	6702
Livestock	115250		48250	
Machinery	80400		25000	4250
Lost Capital (Per cent loss on new building investment).				40

Base Year Change in Inventory

	\$ Change
Machinery Parts	0
Fuel & Oil	100
Breeding Supplies	100
Veterinary Supplies	500
Other Lvstk Supplies	0
Fertilizer & Lime	400
Seeds & Plants	200
Chemicals & Sprays	0
Other Crop Supplies	0

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Worksheet 1G. Expected Price Changes Between Base And Planned Year

	% Change		% Change
Calf Prices	0	Chemicals & Sprays	1
Cull Cow Prices	0	Other Crop Exp	0
Other Farm Rcpts	0	Machine Hire	0
Non-Farm Income	0	Rent	0
Labor	3	Land & Bldg Repairs	2
Feed, Concentrate	2	Insurance	-1
Feed, Forage	0	Taxes	1
Breeding Fees	0	Electricity	0
Vet-Medicine	0	Other Utilities	0
Replacement Lvstk	0	Marketing	0
Other Lvstk Exp	0	Miscellaneous	0
Machine Repair	0	Milk Cows	-1
Auto Exp	0	Dairy Youngstock	0
Fuel & Oil	3	Farm Real Estate	0
Fertilizer & Lime	0	Used Machinery	0
Seeds & Plants	0	Family Living Exp	0

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1988

Worksheet 1H. Relative Cost Factors (Corn Grain = 1.0)

Crop	Machine Repair	Fuel & Oil	Fertilizer & Lime	Seeds & Plants	Chemicals & Sprays	Other Crop Expense
Corn Grain	1.0	1.0	1.0	1.0	1.0	1.0
Corn Silage	1.4	1.5	1.0	0.9	1.0	0.5
Hay	0.9	0.9	0.3	1.3	0.1	1.1
Haycrop Silage	0.9	1.0	0.3	1.2	0.1	0.5
Wheat	0.9	1.0	0.6	0.8	0.1	0.7
Oats	0.9	1.0	0.6	0.8	0.1	0.7
Other Forage	1.1	1.2	0.5	1.2	0.4	0.7
Other Grain	0.9	1.0	0.7	0.9	0.4	0.8
NonFeed Crop	1.0	1.0	1.0	1.0	1.0	1.0
1 Cow and Normal Replacement	1.8	1.3				

Worksheet 1I. FEED USE FACTORS (1 Dairy Cow = 1.0)

Production per Cow Per Year (lbs.)

Type of Animal	Less than 13000		13000 - 18000		Over 18000	
	Concentrate	Forage	Concentrate	Forage	Concentrate	Forage
Cow	1.00	1.00	1.00	1.00	1.00	1.00
Bred Heifer	0.11	0.56	0.09	0.58	0.07	0.60
Open Heifer	0.05	0.31	0.03	0.33	0.02	0.34
Calves (under 6 mos)	0.45	0.07	0.37	0.07	0.29	0.08

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Worksheet 3A. Existing Debt and Account Payable Information

Lender	Balance 1/1/Plnd Yr	Interest Rate	Amount of Payment	No. of Pymts per Yr	Month of last Payment	Stock Requirement		Original Term (Years)	Month Paid in Full
						Amount	Percent		
Farm	27625	11.00	341.05	12	12			20	6
Acc/Pay	440								6

Worksheet 3B. Milk Check Assignments

Lender	Assign- ment Amount	Type: XMC=1 \$/Cwt=2	Balance 1/1/Plnd Yr	Interest Rate	% Bal to Principal	Scheduled Payment	Stock Requirement		Original Term (Years)	Month Paid in Full
							Amount	Percent		
Bank	10.00	1	110498	11.00	100				20	6

Multiple Loans A

Multiple Loans B

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1988

Worksheet 3C. New Debt Information

Lender	Amount Borrowed	Interest Rate	Term (Years)	No. of Pymts per Yr	Month Borrowed	Stock Requirement		Month Paid in Full
						Amount	Percent	
Bank	120000	10.00	7	12	6			

Worksheet 3D. New Milk Check Assignments

Lender	Assign- ment Amount	Type: XMC=1 \$/cwt=2	Month Borrowed	Amount Borrowed	Interest Rate	% Bal to Principal	Scheduled Payment	Stock Requirement		Term (Years)
								Amount	Percent	
Bank	10.00	1	6	185000	11.00	100				20

Multiple Loans A

Multiple Loans B

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1988

Worksheet 3E. Additional Investment Data

	Planned Year Jan 1	Market Value Dec 31
Checking and Savings Account	19000	
Marketable Bonds & Securities		
Supplies Inventory	3500	5500
Accounts Receivable	17000	25000
Estimated Value of Operator and Family Labor and Management.....		30000

Prepared for Clyde & Clint Clements

1988

ESTIMATED CASH FLOWS FOR 1988

	Base Year Adj Accrual	1988 Cash Flow
<hr/>		
Income:		
Milk Sales	193351	227152
Calf Sales	3524	4353
Cattle Sales	12158	15019
Crop Sales	4189	0
Other Farm Rcpts	0	3000
Non Farm Income	0	0
	<hr/>	
Total Farm Income	213222	249524
Total Income	213222	249524
<hr/>		
Expenses:		
Labor	28707	19844
Feed, Concentrate	51720	67740
Feed, Forage	2820	4676
Breeding Fees	4084	4036
Veterinary-Medicine	8361	10328
Replacement Lvstk	1629	2012
Other Lvstk Exp	8362	12330
Machine Repair	9491	15581
Auto Expense	833	833
Fuel & Oil	2006	2517
Machine Hire	869	869
Lime & Fertilizer	9468	11777
Seeds & Plants	3237	3808
Chemicals & Sprays	2554	3307
Other Crop Exp	449	524
Rent	3912	3912
Land & Bldg Repair	3585	5365
Insurance	2760	3820
Taxes	3688	5055
Electricity	2612	3259
Other Utilities	422	521
Marketing	11500	11449
Miscellaneous	1358	1612
Family Living Exp	15000	24000
	<hr/>	
Total Farm Expenses	164427	195175
Total Farm & Living Exp.	179427	219175
<hr/>		
TOTAL INCOME	213222	249524
TOTAL EXPENSES	164427	195175
NET INCOME	48795	54349
CAPITAL SALES		0
FAMILY LIVING EXPENSE		24000
AVAILABLE FOR DEBT PAYMENTS AND INVESTMENT		30349

Prepared for Clyde & Clint Clements

1988

1988 DEBT REPAYMENT ABILITY

Cash Farm Income	249524	
Cash Farm Expenses	195175	
Net Farm Income.....		54349
Capital Asset Sales	plus	0
Non Farm Income.....	plus	0
Family Living	minus	24000
Available for Debt Payments and Investment.....		30349
Funds to be Borrowed.....	plus	305000
Scheduled Debt Payments for..	1988	minus 36714
Additional Debt Payments.....	minus	132621
Investments.....	minus	174250
Excess Repayment Ability.....		-8237

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1988

MARKET VALUE BALANCE SHEET

ASSETS	January 1 1988	December 31 1988
Land.....	126500	162500
Buildings.....	83500	115798
Machinery and Equipment.....	80400	101150
Livestock:		
Cows.....	89250	129938
Heifers (Bred).....	13000	19000
Heifers (Open).....	9000	10714
Calves (Under 6 Mos).....	4000	10667
Feed and Supplies.....	32814	48875
Accounts Receivable.....	17000	25000
Cash and Bank Accounts.....	19000	10763
Marketable Bonds and Securities	0	0
Farm Credit Stock.....	0	0
TOTAL ASSETS.....	474464	634405
LIABILITIES		
Long Term.....	138123	183790
Intermediate Term.....	0	113922
Current Debt and Accounts Payable.....	440	0
TOTAL LIABILITIES.....	138563	297712
NET WORTH.....	335901	336693
PER CENT EQUITY.....	70.80	53.07

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1988

1988 INCOME STATEMENT

Revenue:	
Milk Sales.....	227152
Dairy Livestock	
Cash Sales.....	19372
Livestock Inventory Change.....+/-	55068
Feed and Crops	
Cash Sales.....	0
Change in Inventory.....+/-	14061
Other Farm Receipts.....	3000
Change in Accounts Receivable.....+/-	8000
Gross Receipts.....	326653
Expenses:	
Cash Operating Expenses (less feed and purchased livestock).....	72496
Livestock Purchases	
Replacements.....	2012
Investments.....	48250
Feed Purchased.....	72416
Change in Supplies Inventory.....+/-	2000
Depreciation:	
Machinery and Equipment.....	4250
Land and Buildings.....	6702
TOTAL EXPENSE (Excluding Interest).....	204127
INCOME FROM FARM OPERATIONS.....	122526
Interest Expense.....	23484
NET FARM INCOME.....	99042
NET FARM INCOME (Including all asset value change).....	34042

FINANCIAL ANALYSIS

	January 1 1988	December 31 1988
Liquidity (Repayment):		
Scheduled Debt Payments per Cow	-----	291
Available for Debt Service per Cow	-----	241
Cash Flow Coverage Ratio	-----	0.83
Debt Payments as a Percent of Milk Sales	-----	16
Debt per Cow	1358	1985
Solvency:		
Leverage Ratio	0.41	0.88
Percent Equity	71	53
Debt to Asset Ratio (%)		
Current and Intermediate	0.2	32.0
Long Term	65.8	66.0
Profitability:		
Percent Rate of Return on Equity	-----	1.2
Percent Rate of Return on Investment	-----	4.3
Efficiency (Capital):		
Capital Turnover (Years)	-----	1.7
Real Estate Investment per Cow	2059	1855
Machinery Investment per Cow	788	674
Total Farm Assets per Cow	4652	4229

COST CONTROL

Feed Bought per Cow	582	575
Per Cent Feed is of Milk Receipts	31	32
Machinery Cost per Cow	-----	227
Feed and Crop Expense per Cwt. of Milk	4.96	4.89

Average Future Year

After completing the cash flow analysis for 1988, an analysis of the change (expansion), based on the cash flows for an average future year, was evaluated. To change to sustainable debt repayment ability from the analysis being conducted, NEXT and REVISION were selected from the flows menu to move to Worksheet 0. Worksheet 0 was modified by (1) changing the planned year from 1988 to "average future" (abbreviated "Avg. Future" to fit in the space allowed), (2) placing a 1 after Sustainable Debt Repayment Ability, and (3) changing the 1 to a 0 after Proforma Balance Sheet and Income Statement. Then, the Section 1 input was modified for an average future year (using the information shown on page 87) and Section 2 was completed as shown on page 24.

The following pages present the Worksheets of input that were changed for the sustainable repayment ability calculations (other input are the same as shown for the coming year, 1988, analysis). Pages 92 and 93 are the printout for the sustainable repayment ability analysis.

Cash Flow Information

Expectations for an average future year are slightly different from 1988 because 1988 is a transition year. Items that will differ are:

<u>Item</u>	<u>1988 Value</u>	<u>Average Future Year</u>
Machinery Repair	\$+ 4,000	\$+ 0
Labor Expense	- 9,441	-12,588
Family Living Expenses	24,000	21,000
(enter as deviation for Clint)	9,000	6,000
# Bred Heifers (end of year)	38	43
# Cows (average for year)	126	150
# Heifers (average for year):		
Bred	32	43
Open	23	25
Calves	27	40

Note: Beginning of year number and value of livestock should be left as (entered as) end of base year (beginning of planned year) values. However, end of planned year values should reflect end of year values for the average future year.

Production Increase (%)	1	4
Feed Consumption Increase (%)	2	5
Change in Milk Price	-.75	-1.00
Assessment (marketing charge)	.02 (.39)	0 (.37)

Beginning Planned Year Inventories:

Beginning Planned Year Same as Beginning Base Year - Concentrates	1	0
Purchased Concentrates	1,135	1,300
Beginning Planned Year Same as Beginning Base Year - Forage	1	0
Dry Hay	186	200
Hay Crop Silage	187	225
Corn Silage	552	1,200
Feed Concentrate Price	+ 2	+10

Sustainable Repayment Capacity Information

1. Historical machinery replacement has been around 15 percent of current machinery inventory. In the future it will be 25 percent.
2. The bank loan can be refinanced or reborrowed to purchase replacement machinery at 10 percent interest for seven years.

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Avg. Future

Worksheet 1A. Base Year Flows

Item	Base Year Value	Change in Accounts Rec/Pay	Adjustments to Base Year		Planned Year Deviations	
			\$	%	\$	%
Income:						
Milk Sales	193351					
Calf Sales	3524					
Cattle Sales	12158					
Crop Sales						
Other Farm Rcpts					3000	
Non Farm Income						
Amount of dairy cattle sales resulting from reduction in herd size during base year.....						
Increase in raised cattle sales from reduced rate of increase in herd size in planned year.....						
Expenses:						
Labor	28707				-12588	
Feed, Concentrate	56530	-4560				
Feed, Forage	2820					
Breeding Fees	4184					-20
Veterinary-Medicine	8861					
Replacement Lvstk	1629					
Other Lvstk Exp	8362				2000	
Machine Repair	9491				0	
Auto Expense	833					
Fuel & Oil	2106					
Machine Hire	869					
Lime & Fertilizer	8868		1000			
Seeds & Plants	3437					
Chemicals & Sprays	2554					
Other Crop Exp	449					
Rent	3912					
Land & Bldg Repair	3585					
Insurance	2760					
Taxes	3688					
Electricity	2612					
Other Utilities	422					
Marketing	11500					
Miscellaneous	1358					
Family Living Exp	15000				6000	

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Avg. Future

Worksheet 1B. Livestock Data

Planned Year Livestock Inventory Data

	Number January 1	Value January 1	Number December 31
Cows	102	89250	150
Heifers (Bred)	26	13000	43
Heifers (Open)	21	9000	25
Calves (Under 6mos.)	15	4000	40

	Base Year	Planned Year
Number of Cows (average)	102	150
Bred Heifers (average)	26	43
Open Heifers (average)	20	25
Calves under 6 months (average)	16	40
Pounds of Milk Sold	1504915	
Per cent Change in Production per Cow		4.00
Per cent Change in Feed Use per Cow		5.00
Change in Milk Prices		-1.00
Per Cwt Marketing Charge (Assessment)	0.49	0.37

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Avg. Future

Worksheet 1D. Base Year Crop Use

Crop	Base Year Beginning Inventory	Base Year Purchases	Base Year Sales	Base Year Ending Inventory	Planned Year Beginning Inventory	Planned Year Ending Inventory
------	-------------------------------------	------------------------	--------------------	----------------------------------	--	-------------------------------------

Concentrates:

Beginning Plnd Yr Inventories same as End Base Yr.....1=Yes..... 0

Ending Plnd Yr Inventories same as End Base Yr.....1=Yes, 2=Not Preset.....

Corn Grain (bu)

Price/bu

HM Corn (t)

Price/ton

Oats (bu)

Price/bu

Wheat (bu)

Price/bu

Other Grain (bu)

Price/bu

Purchased Concntrs

\$ Value

885

1135

1300

1300

Forage:

Beginning Plnd Yr Inventories same as End Base Yr.....1=Yes..... 0

Ending Plnd Yr Inventories same as End Base Yr.....1=Yes, 2=Not Preset.....

Hay (t)

56

47

186

200

200

Price/ton

70.00

60.00

65.00

60.00

Haycrop Silage (t)

330

187

225

225

Price/ton

27.00

27.00

27.00

Corn Silage (t)

558

552

1200

1200

Price/ton

20.00

20.00

20.00

Other Forage (t)

Price/ton

Non Feed Crop \$

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Avg. Future

Worksheet 1G. Expected Price Changes Between Base And Planned Year

% Change		% Change	
Calf Prices	0	Chemicals & Sprays	1
Cull Cow Prices	0	Other Crop Exp	0
Other Farm Rcpts	0	Machine Hire	0
Non-Farm Income	0	Rent	0
Labor	3	Land & Bldg Repairs	2
Feed, Concentrate	10	Insurance	-1
Feed, Forage	0	Taxes	1
Breeding Fees	0	Electricity	0
Vet-Medicine	0	Other Utilities	0
Replacement Lvstk	0	Marketing	0
Other Lvstk Exp	0	Miscellaneous	0
Machine Repair	0	Milk Cows	-1
Auto Exp	0	Dairy Youngstock	0
Fuel & Oil	3	Farm Real Estate	0
Fertilizer & Lime	0	Used Machinery	0
Seeds & Plants	0	Family Living Exp	0

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Avg. Future

ESTIMATED CASH FLOWS FOR AVERAGE YEAR

	Base Year Adj Accrual	Average Year Cash Flow
<hr/>		
Income:		
Milk Sales	193351	272697
Calf Sales	3524	5182
Cattle Sales	12158	17879
Crop Sales	4189	0
Other Farm Rcpts	0	3000
Non Farm Income	0	0
	<hr/>	
Total Farm Income	213222	298759
Total Income	213222	298759
<hr/>		
Expenses:		
Labor	28707	16603
Feed, Concentrate	51720	91291
Feed, Forage	2820	3957
Breeding Fees	4084	4805
Veterinary-Medicine	8361	12296
Replacement Lvstk	1629	2396
Other Lvstk Exp	8362	14297
Machine Repair	9491	12519
Auto Expense	833	833
Fuel & Oil	2006	2664
Machine Hire	869	869
Lime & Fertilizer	9468	11777
Seeds & Plants	3237	3808
Chemicals & Sprays	2554	3307
Other Crop Exp	449	524
Rent	3912	3912
Land & Bldg Repair	3585	5365
Insurance	2760	4221
Taxes	3688	5055
Electricity	2612	3995
Other Utilities	422	621
Marketing	11500	12642
Miscellaneous	1358	1813
Family Living Exp	15000	21000
	<hr/>	
Total Farm Expenses	164427	219569
Total Farm & Living Exp.	179427	240569
<hr/>		
TOTAL INCOME	213222	298759
TOTAL EXPENSES	164427	219569
NET INCOME	48795	79190
CAPITAL SALES		0
FAMILY LIVING EXPENSE		21000
AVAILABLE FOR DEBT PAYMENTS AND INVESTMENT		58190

Prepared for Clyde & Clint Clements

Avg. Future

SUSTAINABLE DEBT REPAYMENT ABILITY

Cash Farm Income	298759	
Cash Farm Expenses	219569	
Net Farm Income	79190	
Plus: Non Farm Income	0	
Minus: Family Living	21000	
Available for Debt Payments and Investment.....		58190
Annual Machinery Investment.....	20100	
Principal Refinanced Annually... 120000		
Percent Repaid Each Year..... 10		
Amount that can be Reborrowed.....	12000	
Cash Machinery Investment.....		8100
Sustainable Debt Repayment Ability.....		50090

Other Agricultural Economics Research Papers

No. 88-13	Lessons Learned From the Farm Debt Crisis of the 1980s, W. I. Myers Memorial Lecture	N. E. Harl Iowa State University
No. 88-14	The Assessment of Economic Impacts of Current and Emerging Agriculture Technologies that Affect Water Quality	L. W. Tauer
No. 88-15	A Survey of Dairy Calcium Consumption, Women in Two New York Counties, 1985 and 1987: An Analysis of an Educational Program's Effectiveness	S. Hurst O. Forker
No. 88-16	A Progress Report on the New York FarmNet Program, April 1, 1987-March 31, 1988	C. Delaney
No. 88-17	Consumer Segmentation Analysis of Grocery Coupon Users	M. Meloy E. McLaughlin C. Kramer
No. 89-1	The Competitiveness of New York State Onions During the 1987-88 Marketing Year	E. Figueroa
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No. 89-5	Farmer Investment Behavior: A Review of Literature	Brian T. Brase Eddy L. LaDue
No. 89-6	Eighty Years of Change in Dairy Farming Dryden Township, Tompkins County, New York	B. F. Stanton
No. 89-7	1988 Budget Guide, Estimated Prices for Crop Operating Inputs and Capital Investment Items	Darwin Snyder